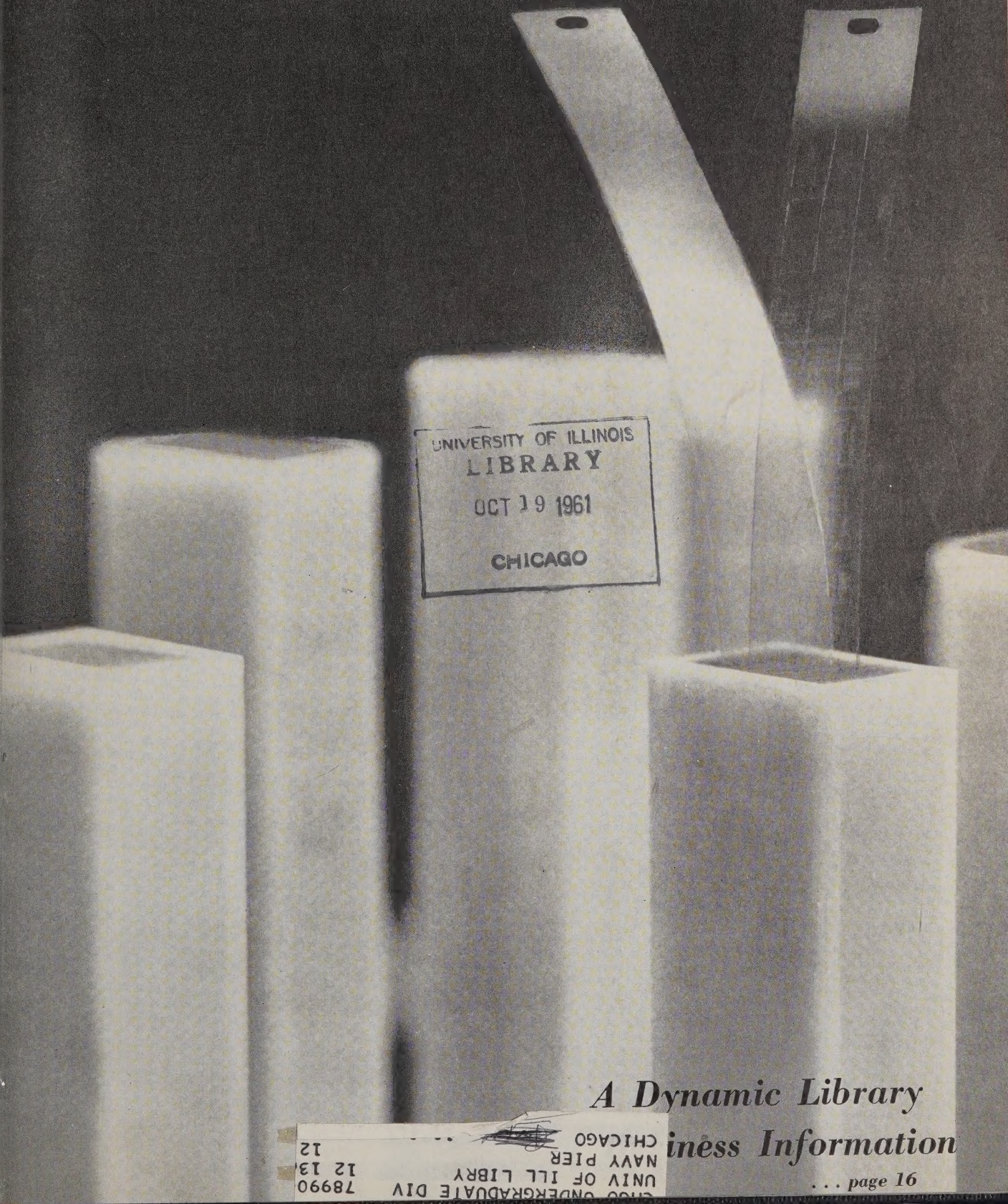
October 1961

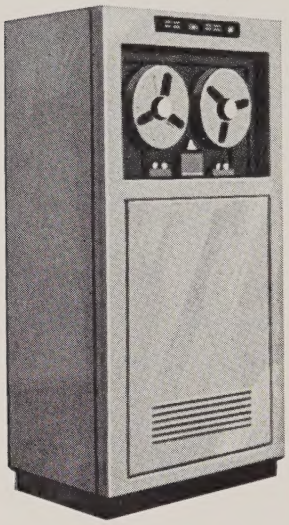
BUSINESS AUTOMATION

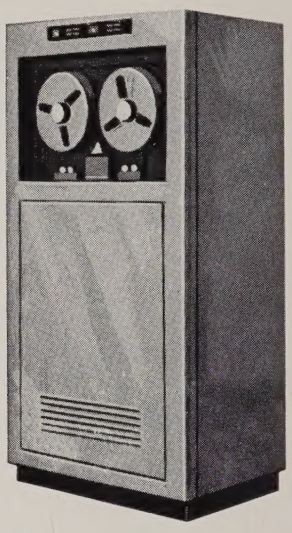


A Dynamic Library
iness Information

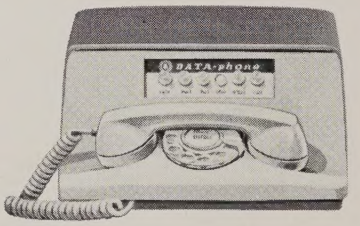
. . . page 16

Now business machines can "talk" over telephone lines





DATA-PHONE service makes it possible. It's the new Bell System development that lets you send business data over regular telephone lines, at regular telephone rates. DATA-PHONE service converts either card-punched or taped data into a special language which can be sent by telephone at speeds up to 1600 words per minute. It speeds data collections from branches, improves customer service, promotes more efficient, more profitable operations. *Like to know more?* Just call your Bell Telephone Business Office and ask for a Communications Consultant. He'll bring you complete details. No obligation, of course.



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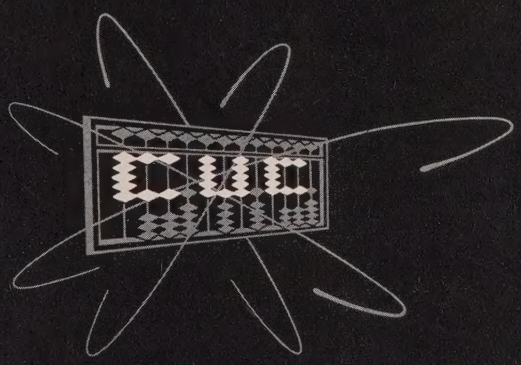

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BUSINESS AUTOMATION

Oct., 1961
Vol. 6, No. 4

Reporting and interpreting for management on ideas, developments, applications, results and impact of business automation in commerce, industry and government.

EDITORIAL OFFICES

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BUSINESS AUTOMATION is published monthly and © copyrighted 1961 by OA Business Publications, Inc., 288 Park Ave. West, Elmhurst, Illinois. Accepted as controlled circulation publication at Elmhurst, Illinois, and Lafayette, Indiana.

Subscription Rates: United States, one year, $5; two years, $8. Canada, one year, $6; two years, $10. Pan American and foreign, one year, $12; two years, $20. Single copies: U. S.—75c; all other countries—$1.50.

Change of Address: Send new and old addresses (preferably with a BA label), including postal zone numbers, to Circulation Department, BUSINESS AUTOMATION.

Receipt of changes by the 10th of the month will assure correct addressing of next issue.

Postmaster: Send notices to BUSINESS AUTOMATION, 288 Park Ave. West, Elmhurst, Ill.

"Quotes"

Scanning the news for interesting comments on the field of business automation.

"Our fear of being dominated by machines in the future is irrational, for our greatest enemy is ourselves, not the machines we create; it is worth remembering that Mary Shelley's hero, Frankenstein, had a useful mechanical servant in his robot until he endowed it with a human heart —and only then did it become a monster."—*Sydney J. Harris, noted newspaper columnist.*

"There will come a day when man's creative mind will be combined with infinite storehouses of information. All knowledge will be available at command, waiting to parade in classified order. Man will be freed from the drudgery of hunting for a thousand needles in a thousand haystacks; freed from language barriers; freed from duplicating the work of another."—*W. P. Livingston, vice president, Bankers Trust Co., New York City.* (For more views on information retrieval, see page 16.)

"I foresee the day when bank checks and most other forms of today's original records may become extinct. In buying an automobile or a necktie, you will be identified by your thumb, placed in front of the scanning device of an electronic computer, and your account automatically will be debited and the seller's credited."—*Dr. Simon Ramo, executive vice president, Thompson Ramo Wooldridge, Inc.*

"As much public backing as possible should be given to union-management relationships which make rapid introduction of new technology possible. It is important that the present efforts—either the Office of Automation and Manpower that Labor Secretary Goldberg recently established or the legislation that will emanate from the House Labor Committee hearings on automation —do not result in measures which will control the rate of technological change."—*John Diebold, president, The Diebold Group, Inc.*

"Some people still talk of computers as mere machines that juggle the same old problems, but do it faster. They're missing the big point.

"Put it this way: Here's a man with just one dollar in his pocket—one lonely buck. Suddenly fate waves her magic wand and that man has $1 million to spend.

"That's not just more of the same. It's a whole new life—new opportunities, new attitudes toward humanity, the chance to travel, to see and do things hitherto utterly impossible."—*Dr. Richard Hamming, Bell Telephone Laboratories, speaking to the Bendix G-15 Users Exchange Organization conference.*

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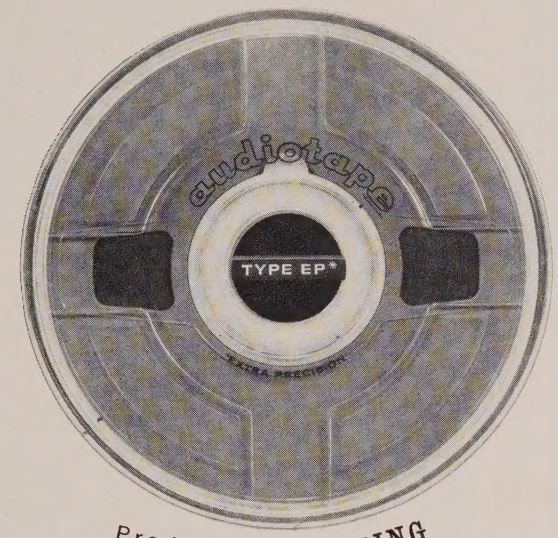

Products are judged by the customers they keep. And for years EP Audiotape, the extra precision computer tape, has been ordered (and reordered) by the most prominent firms in the country. ■ The reasons are evident. Stringent manufacturing procedures insure tape of the finest quality—a fact confirmed by the continuing tests of customers' own engineers. ■ The precision built into EP Audiotape is complete assurance that it will perform and perform consistently on computers, in telemetry, seismography and automation. ■ Why not investigate EP Audiotape for your computer? Every reel is 100% certified according to all the computer manufacturers' own specifications. ■ For more specific product information, get in touch with Computer Department, AUDIO DEVICES, INC., 444 Madison Avenue, New York 22, N. Y.

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SYSTEM DEVELOPMENT CORP.
SOUTHERN RAILWAY SYSTEM
ILLINOIS CENTRAL RAILROAD

For More Information Circle Reader Service Card No. 155

Letters

Dear Sir:

I read your article in the June issue concerning the survey of machine accounting salaries. I consider most of it worthless, since the emphasis has been placed on the number of prints and one of the most important elements was the functions performed by the various machine accounting managers in the various businesses. You should be aware that whether or not a machine accounting manager or a data processing manager also is responsible for the systems design portion of data processing has a considerable impact on the salaries paid the managers.

For example, on page 22 in the article, the last two portions of the job description of the machine accounting manager mentioned that he determines the feasibility of converting manual procedures to mechanical methods. This is a responsibility normally found in the systems design function, whether or not it is under the machine accounting manager. And as I previously stated, whether he manages this function makes a difference as to whether his pay is high or low. Also, there was no distinction in the article between the operation of business and engineering and scientific processing centers.

It would seem the article threw together fruits and vegetables in order that statistics could be simply displayed. Articles of this nature disturb professionals in the field. I consider it a waste of time.

L. F. Cimino
Manager, Business Systems
General Electric Co.
Missile and Space Vehicle Dept.

Editor's Note: We have found, through careful study, that point size is the most acceptable criterion for comparison of salaries on the supervisory level. The job descriptions were developed in consultation with hundreds of machine accounting managers and salary administrators. Survey participants are asked to match their job specifications to the descriptions, and not to report salaries if the description does not apply. It is our experience that the systems design function is seldom under the machine accounting manager, but certainly he is consulted as to the feasibility of converting manual procedures to mechanical methods. It is difficult to imagine a conversion being "forced" upon the manager by a systems department, though such cases might exist.

Dear Sir:

A copy of your May 1961 issue was forwarded to this office with the notation to check the fine articles included for possible use.

We have gleaned many good ideas from the stories you have printed, and at the same time enjoyed greatly your selection of computer cartoons.

Is there any possibility of obtaining permission to reproduce the cartoon which appeared on page 63?

James F. Harroun
Division Editor
General Products Div.
International Business Machines Corp.

Random Access

Information bits from the editors' memory files

Electronic Ballots—and Bugs

The first test of electronic ballot processing, held recently in Cincinnati, produced results that were something less than sensational, yet demonstrated the feasibility of such a system. In the test, Cincinnatians were asked to vote on their favorite nine of 27 former Presidents prior to Woodrow Wilson. Polls were set up in downtown buildings and shopping centers. Ballots were of conventional style, but were to be marked with special graphite pencils. Mark sensing machines were used to transform written ballots to punched cards, which then were counted by a computer.

Trouble developed at the mark sensing stage, but was not discovered until the computer started to reject questionable ballots. IBM representatives who conducted the test blamed the trouble on modification of the punch and read units associated with the mark sensing equipment. Another problem resulted from failure of some voters to use the prescribed pencils for marking. All told, it took 10 hours to tabulate some 5,500 ballots, with an error percentage of 20 to 25 percent. Abraham Lincoln was the top Presidential choice, with George Washington and Thomas Jefferson running a close second and third.

Despite the mechanical failures, election officials felt that the experiment went well and proved that such a system could be workable and accurate. Two interested observers were Charles M. Pace, representing the Norden Div. of United Aircraft Co., and Warren L. Schwenker of Remington Rand, a division of Sperry Rand. Norden has developed a system combining mark sensing and tabulating, in one operation. Remington Rand uses an optical scanner to convert ballots to punched cards.

Rather Wet At Watford

The British Railway's audit office in Watford, England, had a rather soggy situation on its hands, according to a report from the ADP journal in London. It seems that a fire caught hold of the tabulating department and besides considerable damage to equipment, the department's 100,000 pre-punched card file was thoroughly water-soaked.

Though seemingly unusable, several attempts to salvage the file were made. Drying the cards by heating them caused a contraction and the column reading was no longer accurate.

Finally, after allowing the cards to dry naturally, a Carditioner (product of Cummins-Chicago Corp.) was brought in and the entire file processed through the "reconditioning" operation. The result: 90 percent of the file was salvaged and put into shape for automatic reproduction of a duplicate file. Use of the Carditioner saved the road from an expensive key punch job.

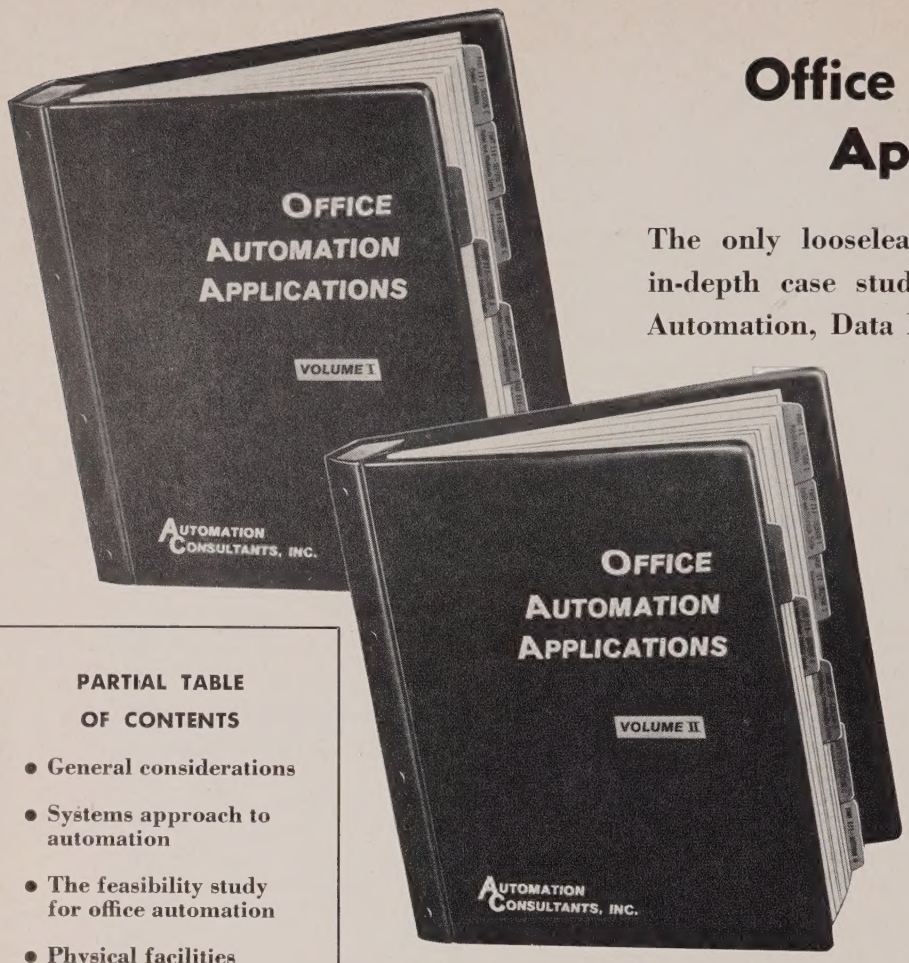
Something Fishy

A $3 million fish story recently caused the temporary shut-down of the Armour Research Foundation computer installation in Chicago. The unit has two cooling systems, one using distilled water and the other city water.

The city water system became clogged with small shad that gather around the Lake Michigan water intakes and evidently slipped through the screening process and into water going to ARF's air and water conditioning cooling system. The multi-million dollar installation was quickly "back on the air" after the fish jam was removed.

Cuban Progress

Part of the Cuban "learning to live with less" program, as disclosed by U. S. NEWS & WORLD REPORT, involves teaching the people to count on the abacus (Russian made) so they will not have to rely on adding machines and other keyboard equipment from the United States.



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- Physical facilities
- Selecting, training and organizing computer personnel
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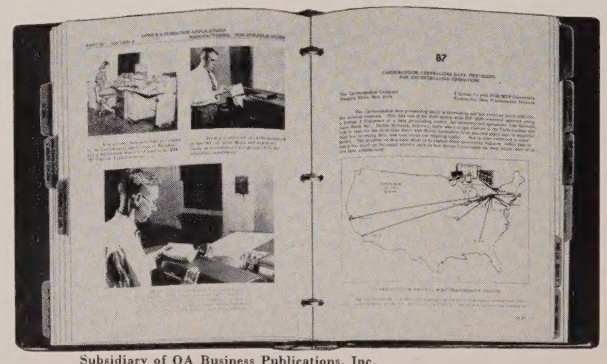

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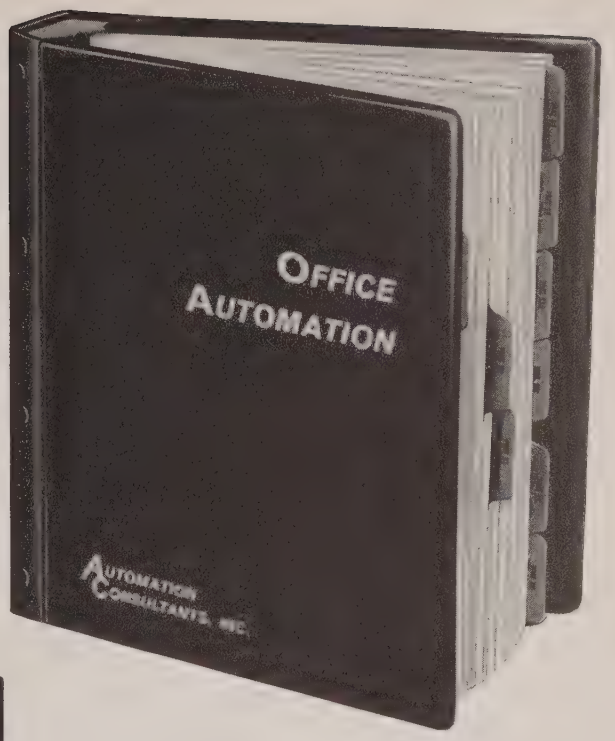

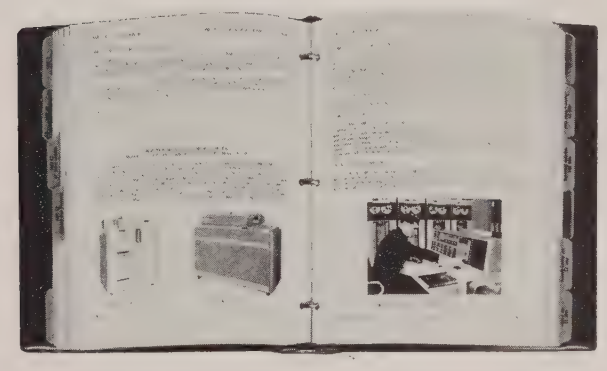

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- **EDP printers for computer output-descriptions, illustrations and comparative chart**

Other chapter headings

- **How Is a Computer Programmed?**
- **What Computers Can and Cannot Do**
- **Points To Be Carefully Watched When Acquiring a Computer**
- **Should Electronic Equipment Be Purchased Or Leased?**
- **Helpful Reading Material On Electronics Conferences, Exhibits, Seminars, Schools and Films of Interest**

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Publisher's Desk

BY THE TIME this issue is in the mail, our staff will be 'at home' in our new publishing headquarters in Elmhurst, Illinois, a suburb of Chicago. An architect's sketch appears on page 64.

The product of several years careful planning, our building is designed to provide the most efficient publishing operation possible, with ample room for additional expansion. It more than doubles our former office space in downtown Chicago, thereby easing a cramped situation which has increased with the steady growth of BUSINESS AUTOMATION.

One of the special features of the building is a library, which we plan in time to become the largest single reference facility on the subject of business automation and data processing. It is available for use of any reader who wishes to visit us in person.

In addition to BUSINESS AUTOMATION, the new home of OA Business Publications also will house OFFICE APPLIANCES, for 57 years the business journal for office equipment dealers; DAILY OFFICE APPLIANCES, a newspaper published at several conventions; and the annual OA BUYERS INDEX, the world's largest directory of office products. A book division is being formed now for the distribution of specialized volumes in the fields served by our periodicals.

Our subsidiary, Automation Consultants, Inc., will continue to be headquartered in New York City, although some of the administrative functions are handled at Elmhurst.

One of the advantages of our new location is that O'Hare International Airport, now the center of air transportation in metropolitan Chicago, is only fifteen minutes away. Any of our friends with time between flights are cordially invited to visit our publishing headquarters and to make full use of any of our facilities. A phone call to TErrace 4-9350 will bring our station wagon to O'Hare for transportation to Elmhurst.

The latchstring is out. I hope many of you will use it.

Charles W. Gilbert

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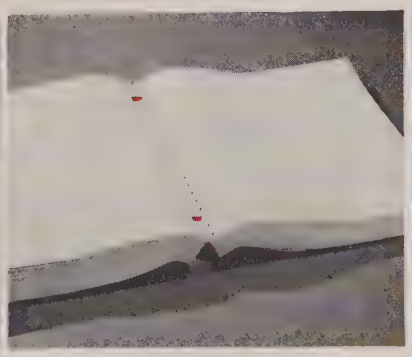

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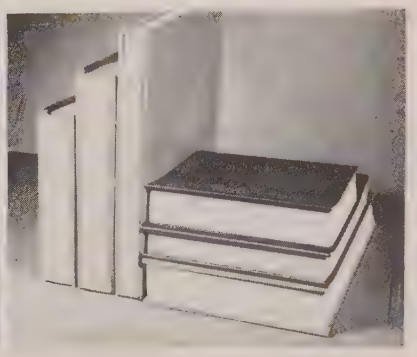

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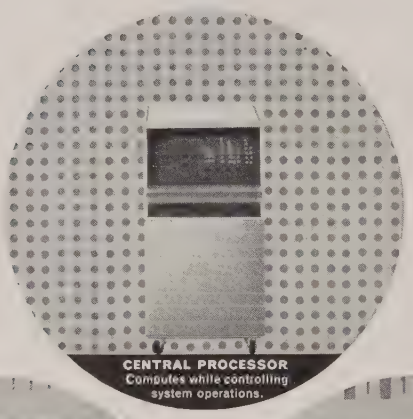

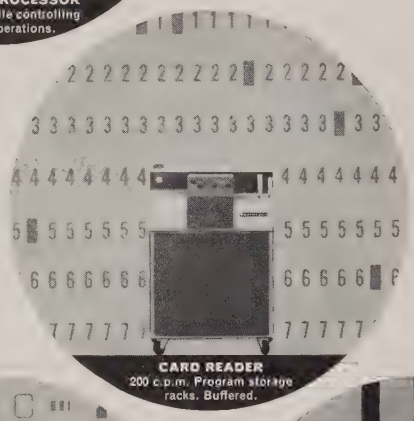

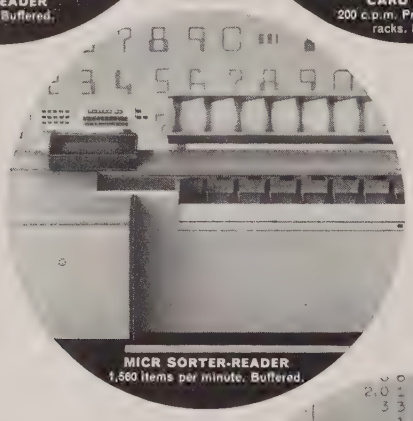

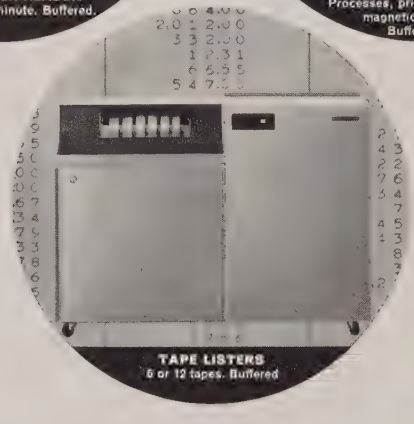

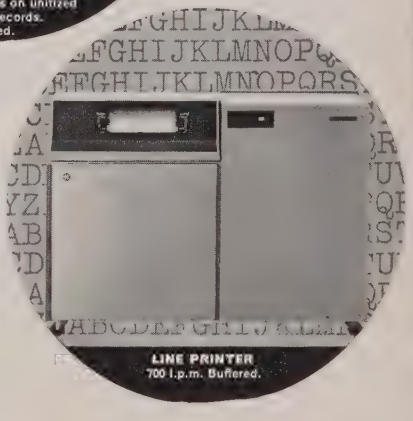

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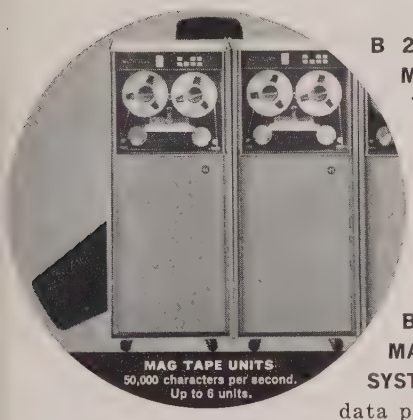

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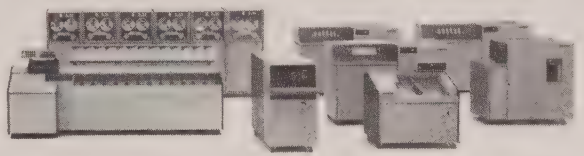

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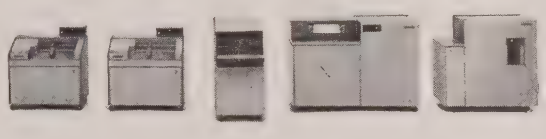
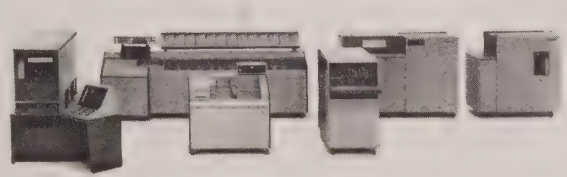


B 250 PUNCHED CARD AND LEDGER RECORD SYSTEM: It is unique in handling financial and commercial applications where unit ledger records are desired. Processes directly from input to output ledger. Offers the advantages of line printer, ledger processor, tape lister, MICR sorter/reader and card punching and reading.



For the configurations described above there is a powerful library of programs. Among them: A report generator which accepts mag tape or punched card input and produces object programs for immediate or subsequent use. A sort generator which accepts variable length records and from four to six tape units. An assembly program. And a full complement of utility routines. • Which system for you? A Burroughs Systems Counselor will be able to answer that to your complete satisfaction. Burroughs Corporation, Detroit 32, Michigan.

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For More Information Circle Reader Service Card No. 161

A breakthrough in storage and retrieval techniques makes it possible for business to mechanize its information handling.

PHOTO-IMAGE STORAGE— Its Role in Modern Business

By John H. Veyette, Jr.

EVERY BUSINESSMAN, engineer or scientist at one time or another has wished for a "Genie" that could produce a certain policy memo, drawing or document needed at a critical moment.

For years, file clerks, secretaries and administrative assistants have attempted to fill in for the unavailable Genie by producing whatever they could find to answer such requests. Large public libraries with millions of books and magazines and smaller subject-oriented corporate libraries also struggle to perform similar functions within limited capabilities. Now it appears that mechanization will ultimately provide the solution to the information retrieval problem.

Indicative of the dramatic progress being made in the development of new systems to handle huge quantities of information is the recently demonstrated IBM WALNUT photo-image and retrieval system, which can retrieve any one of millions of printed or typed pages, drawings or photographs within five seconds. Images of stored information are transferred to the tiny film window of a photo-aperture card, which can be projected on a viewer or printed out as full-size copy.

Although WALNUT is a prototype system developed especially for the Central Intelligence Agency, its real significance is perhaps best appreciated in terms of what this type of technology may offer others with information handling problems, such as any large business organization.

For purpose of illustration, let us consider the hypothetical case of the Better and Best Electronics Manufacturing Co. (BBEM). This corporation makes hundreds of items which are marketed directly to industry and government agencies. It also makes components on a sub-contract basis for missile and space programs. Its manufacturing facilities are dispersed in eight regional plants, each with the capability to manufacture any product. Through licensing agreements, its products also are manufactured and marketed in seven foreign countries.

While BBEM's manufacturing facilities are dispersed, its design and drafting operations are centralized, and all research and development is accomplished at corporate headquarters. In addition, it has an active materials group which accomplishes materials research, testing and evaluation. An extensive Reliability and Environmental Test Laboratory supports the quality control program to insure that products meet customer-established specifications. A Technical Manuals and Handbooks Group is responsible for providing this type of engineering documentation support.

Each of these activities, in addition to others such as administrative and marketing operations, produces and uses a considerable variety of information. In order to evaluate handling possibilities, such information first must be classified (see chart, page 21).

From this classification of typical information types, it readily can be seen that the same information exists in several different locations. Yet, even with this duplication of files, information desired at a particular time frequently is not immediately available. A man desiring certain

◄ Operator holds plastic cell loaded with film strips. The bin, or document file, contains 200 such cells.

Image File Stores Millions of Pages of Information

The image file, contains bin, cells, access mechanism, ultraviolet system and photo-aperture cards, is capable of storing 990,000 images and is about the size of a standard desk. Storage capacity is equivalent to 100 file cabinets.

The 200 cells of the file are arranged in a circular bin. Image reproduction is initiated when the punched information in the unexposed aperture card is read by a modified IBM 056 verifier built into the file. By reading the address from the aperture card, the required cell is aligned with the pickup mechanism. At the same time, the pickup device has moved to the appropriate one of 50 strip positions and the optical system has shifted to the correct image column. The strip is drawn up to the optical path in grooves identical in size to those in the cell, thereby maintaining constant support on the strip edge. A photocell insures that all strips are properly replaced before the bin is released.

A high pressure mercury arc lamp provides ultraviolet energy to expose images. The photo-aperture card has four image positions, each reduced 27.2 times from original size. All four images are heat-developed at the same time. Each image file can produce an average of 720 cards per hour.

Image files may be added as document holdings increase; however, the image file also is capable of single cell operation. Cells containing semi-active or inactive documents can be removed and shelf-stored.

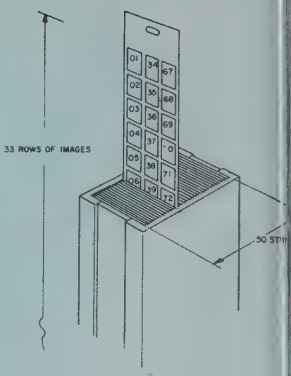
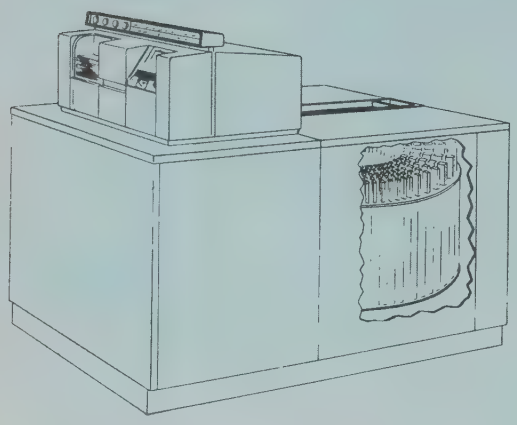
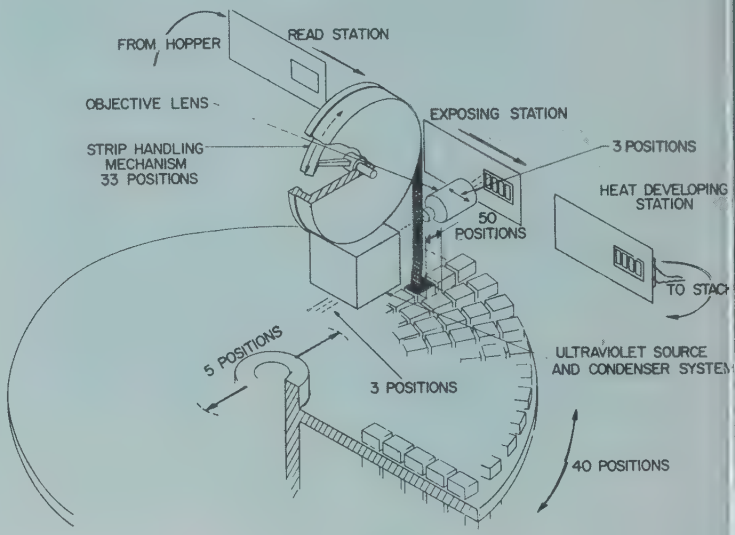


Image File Cell



Overall perspective showing cutaway to image storage bin



Access mechanism of Image File, showing ultraviolet optical system and photoaperature card

facts has to make phone calls, write memoranda or have someone hunt through files or a library—and perhaps do all of these things—to get the information he needs. Sometimes, in spite of all possible searching, he doesn't get the information at all, for it just hasn't been organized for later retrieval.

The problem then is the handling of this information, all of which is vital to the successful operation of the BBEM company. While the illustration poses a single corporate information retrieval problem, it also might be well to consider the larger and more general problem.

Part of the larger problem is the great quantity of information we are producing. There is no doubt that we produce more new information than we can process and utilize effectively. In most cases, we are attempting to process the growing flood with methods that were being questioned when the volume was half what it is today. As desirable as it is to increase one's reading speed, we could never achieve the capability to read all we should. Stated as simply as possible, we have more information today than we are prepared to utilize. This is true at international, national and localized levels of our society.

But even though the increasing amount of available information is creating a problem, we should avoid any attempt to restrict information production. Only by recording one's achievements can our contemporaries take immediate advantage of our labors. It is equally important that we record today's work for posterity.

Our traditional systems for indexing information for future retrieval break down under the changing times of science. Therefore, the greatest problem is indexing and storing this mass of complex, shifting knowledge so that we can retrieve it when we want it, and more important, so that others can find what we have done if they want it.

The frustration, after hard labor, of "discovering" that which already has been done before is immeasurable. The impact of such duplication on corporate budgets is even harder to evaluate. In the final analysis, every dollar wasted in duplication has a direct relation to net profit.

New methods and technology for indexing, storing and retrieving information are required to solve these problems. The WALNUT system is a useful illustration of the probable direction of these new approaches and of how they could be applied to the specific problems of BBEM.

Three billion characters

Developed after years of research, it is a large-capacity, random access document retrieval system which utilizes the storage of highly reduced images, is capable of handling millions of pages of stored material and provides rapid, selective output. The system consists basically of a random access document index, a document image converter and a random access image file.

Features of the system include:

1. Random access to both index and image file, eliminating the time and cost of serial searching.
2. Both image file and index of modular design, permitting minimum initial installation, but with add-on as needed up to three billion characters of index and 100 million pages of document storage.
3. Contents of the image file are never out of storage. No problem of lost, misfiled or "in-use" documents when information is required.
4. New documents enter the system rapidly since image converter and index use previously prepared microfilm and punched paper tape.
5. System is easily purged to make way for more active material by the removal of cells containing up to 4,950 pages each. Purged cells are stored easily and can be re-inserted into the system if needed.
6. The index and its information are physically separate from the image file.

The index is an adaptation of the RAMAC (Random access method of accounting) computer. Data can be read in or out by punched paper tape or magnetic tape. The index is divided into three sections: the key word table, the subject index and the document address index. The processing unit serves as a comparator only.

Data loaded into the random access index causes the files to be scanned for matching entries. The records in the subject index may be variable in length; those in the key word table and document address index are of fixed length.

The subject groups are alphabetically ordered as in the card catalogs of conventional libraries. The index provides bibliographic and punched address cards output. The cards are used to address the document file.

The image converter optically reduces and transfers conventional perforated 35-mm microfilm images to film strips for storage in the image file. At the same time, it assigns image file addresses to the image and records these on punched cards controlling the conversion process. The address information then is stored in a portion of the index.

The image converter requires only initial registration of the microfilm reel and deck of associated cards, and operates unattended thereafter. Error checking facilities are built in.

The image file permits rapid, random access to any of the 990,000 images stored in a module. A module consists of 200 cells, each one containing 50 strips and each strip holding 99 images. Modules may be added to the system as required.

Desired images retrieved

Desired images are retrieved by transferring them optically to photo-aperture cards. These may be used in conventional viewers or enlarged to full size. The strips and aperture card films are an ultra-violet-exposed, heat-developed photo material that permits fast, dry processing in a lighted room. High resolution film (550 lines per milimeter) is used in the file.

Documents are first entered into the system by assigning each a unique document number. The number of pages are then counted and recorded. An index record, which includes key words and an abstract from the document, is punched on paper tape. The key words serve the same function as the subject headings or coordinate indexing terms used by conventional library methods. They may designate entries by subject matter, author or publishing activity, or they can be the "significant" words chosen from the actual text material.

The paper tape index data then is entered into the magnetic index. The documents are micro-

About the Author

John H. Veyette Jr. is a senior planning representative in information storage retrieval and processing, Advanced Systems Development Div., International Business Machines Corp. A graduate of Norwich University (BS, 1939), he served in the Air Force from 1942 to 1954, attaining the rank of Lieutenant Colonel as Chief, Technical Information Div., Armed Forces Special Weapons Project at the Pentagon.

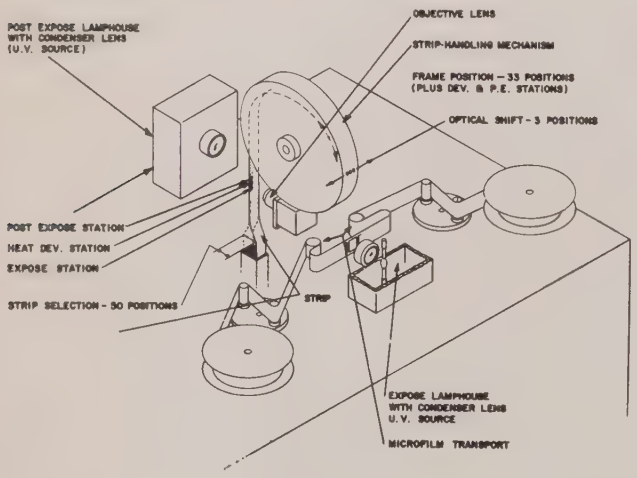
Image Converter Transfers Film to Film

The image converter (above) transfers document images to the film strips, assigns addresses and punches the addresses into the input control card. Silver-halide 35mm perforated microfilm is used as the input medium. After transfer, the microfilm may be used as archival storage.

The image converter accepts one reel of developed microfilm, the associated input control cards and an image file containing unexposed film. The operator insures that the first card and image match and operation then continues unattended until the reel of microfilm has been reproduced on the film strips.

A document may continue from column to column on a strip, or from strip to strip on a cell, but not from cell to cell. Output of the converter is 1,500 frames per hour, permitting a cell to be filled in about three hours.

Top deck of the image converter (below) contains the microfilm drive mechanism, strip selection and pickup mechanism, optical system and film strip.



filmed and an input control card is key punched with the document number and page count.

The microfilm and the punched input control cards are verified and loaded into the image converter. The microfilm images undergo further reduction in their transfer to the film strips, which are the storage medium of the image file. When the document enters the storage medium, it has been reduced to less than a thousandth of its original size. Transfer speed of the image converter is 1,500 frames per hour.

Besides transferring document images to film strips, the image converter assigns image file addresses to each document and punches these addresses in input control cards. All information in the input control card is recorded in document-number sequence in the document address section of the index. Each filled cell is inserted in its assigned location in the image file.

Filling out a form

Documents are retrieved by filling out a search form with as much information as can be specified. The search form is similar in format to the index record. Search criteria are read into registers of the random access data processing unit which initiates a search of the subject sections of the index which contain the records for the specified key words. All records matching the input criteria are printed out.

At the same time, the document address section of the index causes an address card to be punched for each matching record. The requestor reviews the output and selects the address cards of the documents desired. The selected cards are then processed through a reproducing punch which transfers the addresses, page count, document number and requestor number into a blank photo-aperture card which has space for four images.

When the aperture card is inserted into the file, the punched data initiates machine operations which cause the transfer of the requested document images to the card. Trailer cards are automatically produced for documents having more than four pages. Cards may be studied by the requestor with a specially designed viewer or used to make full-size reproductions.

Whether internal policy information or a magazine article on a competitor is being stored, such a system offers great flexibility, depending on the company's needs. The full document, an abstract or just the table of contents may be stored. Pages of reports containing problems, conclusions or recommendations can be selected for the file, or charts, graphs and photographs may be all that is required later to reconstruct the desired information for a requestor.

Listing of Representative BBEMo Activities and Types of Information Used or Produced

Activity ► / Type of Information	Research and Development	Materials Group	Reliability and Environmental Test	Production Design and Drafting	Manuals and Handbooks	Manufacturing
Internally produced technical notes, memos, reports, proposals	X				X	
Researcher notebooks	X					
External information (books, journals, pamphlets, documents) relative to BBEMo interests	X	X	X			
Customer established specifications and standards; design requirements	X	X	X	X	X	X
Materials group produced information on new materials or applications	X	X		X		
Specifications and data on off-the-shelf or subcontract procured items	X		X	X		
Preliminary design drawings	X					
Prototype drawings and documentation	X			X		
Competitive equipment information—evaluations	X	X	X			
Historical developmental information	X	X				
BBEMo produced specifications and standards	X	X	X	X	X	X
Approved suppliers list	X	X		X		
Reliability and Environmental test, results, conclusions and evaluations		X	X		X	
Testing procedures			X			
Testing equipment in-use and new			X			
Production drawings, including diagrams, assembly drawings, and exploded views, and schematics				X	X	X
Product specifications and standards				X	X	X
Parts lists, bills of materials, parts catalogs				X	X	X
Drawings of suspended production items				X		
Management operating information	X	X	X	X	X	X
Published manuals, original art work, photographs					X	
Quality Control policies and procedures						X
Acceptance test results						X
New manufacturing methods and equipment						X

Since the film strip cells can be removed to static storage locations, information that is not as important today as it was yesterday can be removed from the active document files. This insures up-to-date facts for the requestors and not information that is in the process of being revised.

For testing and designing activities, the system offers still another benefit. Prior work often guides current explorations, and with a comprehensive report of earlier activities available, there is no need to duplicate past test or design efforts.

Several departments frequently need the same information. Manufacturing facilities at the BBEM company, for example, require 15 sets of engineering drawings. With an original—and the latest—drawing in the storage system, many copies may be produced. Also, drawings in aperture card form are easier to handle and mail.

Still another possibility are documents that normally do not appear to contain information of widespread interest. An example of this is the research notebook, usually maintained for posterity and to support patent applications or claims. In most cases, such notebooks are filed in dead storage and the valuable data is irretrievably lost. Indexing and entering significant pages into the storage system would provide a means for future researchers to benefit from the work already accomplished by his predecessors.

While IBM's prototype system was designed for a pacific purpose, technology employed in WALNUT can be used to provide informational support for many of BBEM's operations. For corporations with similar problems, photo-image technology shows promise of becoming a powerful tool for the storage and retrieval of information. ■

One-day delivery to customers is only one benefit derived from this 'total systems' approach to business automation

Ryerson Turns Paperwork Into Working Paper

By Donald Young

Step One in a tightly-knit chain of paper handling procedures: a salesman routes an order along the conveyor.

THIRTY MINUTES from the time an inside salesman at Joseph T. Ryerson & Son, Inc., Chicago, receives an order, the order is in the warehouse, ready to be made up for delivery.

This speed in processing paperwork is typical of the results developed through Ryerson's "total systems" approach to business automation. Ninety percent of the orders handled by Ryerson receive same-day or next-day delivery.

All sales units have been consolidated on the fifth floor of the company office building. On the same floor are the headquarters of the company's stenographic department, since about 75 percent of that department's work-load is related to the sales function.

Order processing units and other related activities, including mechanical order entry, credit, merchandise, timing and estimating, billing, central files, claims, communications and office management, are on the fourth floor.

These, and other, departments are linked with a constant-speed mechanical conveyor system manufactured by Chainveyor Corp. The first of its kind in the midwest, the conveyor is used to move orders, mail, internal correspondence, files and other lightweight materials from desk to desk, room to room, floor to floor. Manual loading can be accomplished at any point; unloading is accomplished automatically at predesignated stations.

Powered by a ¾-hp motor, the conveyor moves at a rate of 45 feet per minute. Along its 480-ft. "message path" it has clamp-type carriers affixed to the conveyor chain at one-foot intervals. These automatically trip and drop papers at any of the 12 discharge stations according to a well-defined color code which identifies each carrier with its appointed receiving station.

To keep pace with the transmittal of written communications, oral communications have been improved, internal telephone traffic has been reduced and lines have been kept open for incoming customer calls with the installation of a Ring-Master intercom system. An automatic switchboard connects the 75 stations in this system (as many as 200 are possible), relieving the regular telephone lines of some 1,500 calls a day.

Forty inside salesmen are furnished with these intercom units and use them to check inventory status with stock record men and to get needed

Ryerson's 7070-1401 computer room

Bellfast teletype systems receive messages and orders from 50 offices and plants across the country.

Forty inside salesmen flank the serpentine paper conveyor in the Chicago sales office. In 30 minutes, an order is ready to ship.

correspondence and other records from the central filing department (via the conveyor system). The sending and receiving units, installed at a cost of approximately $225 apiece, are smaller than a telephone and they permit hands-free, two-way communication between departments. Push-button dialing makes the system five times faster than standard dial telephones.

Located one floor below the sales department, the central filing department at Ryerson has replaced standard five-drawer filing cabinets with new, open, two-level File-O-Graf shelves. This system makes it easier to locate and remove reference materials, cuts correspondence filing time in half and reduces fatigue among the filing clerks, resulting in an increase in efficiency.

Containing 24 six-foot units, the filing system can hold about two million pieces of paper (equal to 500 file drawers' worth). Here, Ryerson stores 18 months' general correspondence on every account. Current papers are filed on the lower shelf (knee high), while older material is filed on the upper shelf (waist high). Six thousand alphabetical tab guides implement speedy reference.

When working, file clerks remain seated at chables (combination chair and table), which ride smoothly up and down the aisles in metal tracks. Bending and stretching are not required.

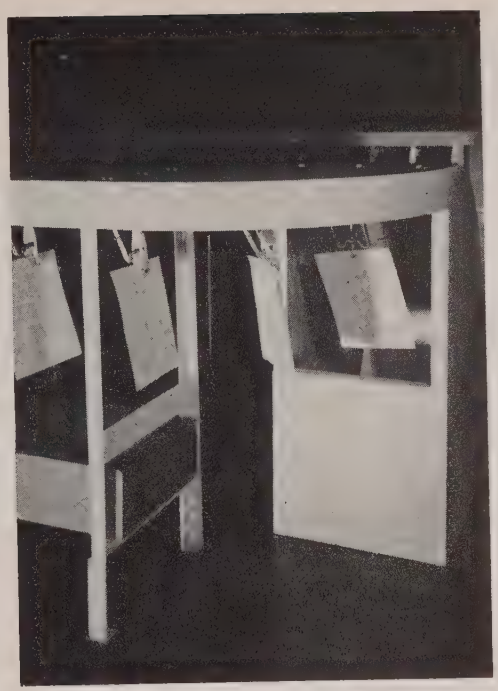
Four girls spend an average of two hours a day filing 3,000 to 5,000 pieces of correspondence. This time includes all pre-sorting and indexing necessary to prepare the paperwork for filing.

The combination of these internal improvements—the highly-flexible conveyor system, the intercom system and the central filing system—keep Ryerson's orders moving steadily, so that they do not pile up at any one point. The paper workload is spaced out evenly throughout the day, contrasted to previous methods when regular telephone lines were used for oral communications, a moving belt system and hourly messenger service handled the bulk of internal communications and cumbersome filing systems made it difficult to move records in or out of storage.

St. Louis salesman

A distributor of steel, aluminum, industrial plastics and metal fabricating machinery, Ryerson has 20 service centers from coast to coast. A merger with Inland Steel in 1935 resulted in a manufacturing-distributing combination that has become one of the largest in the world.

Ryerson, Inland, Inland Steel Container and Inland Steel Products have some 50 plants and offices in 30 cities, all connected by a Bellfast elec-



Conveyor carries Ryerson paperwork from desk to desk, room to room and floor to floor.

Papers automatically trip free from the conveyor at their appointed destinations.

tronic teletype network. This network is controlled out of the Wire Communications Center on the third floor of the Ryerson building.

If a St. Louis salesman wants to know whether a certain item of stainless steel is available at Cincinnati, Buffalo, New York, or Los Angeles, where stocks of the item normally are carried, he would write his inquiry on a message blank and give it to the teletype operator. The operator would type the message, which would include a listing of the four plants to which the inquiry is directed, on a machine which punches paper tape. The operator then would insert the tape in the Bellfast teletype transmitter.

While this is going on, an electronic selector in Chicago, working continuously, checks the St. Louis sending mechanism at split second intervals —just as it checks the sending mechanisms at all other plants and offices in the network. Upon finding the tape in the St. Louis transmitter, it turns on the machine there, takes the message at the rate of 75 words per minute and shuts off the machine again. All of this is done automatically.

From Chicago, the message is relayed to the appropriate four locations, using control panel pushbuttons to turn on receiving sets at those points. Within minutes, the inquiry has been received by plants in four separate cities. These plants answer the inquiry individually by inserting into their transmitters a taped message, which is picked up automatically by Chicago and relayed to the person who originated the inquiry.

The teletype communications center, under the supervision of Howard Ruebe, manager of wire communications services, was first installed in 1956. It is used extensively for transmission of inter-plant orders.

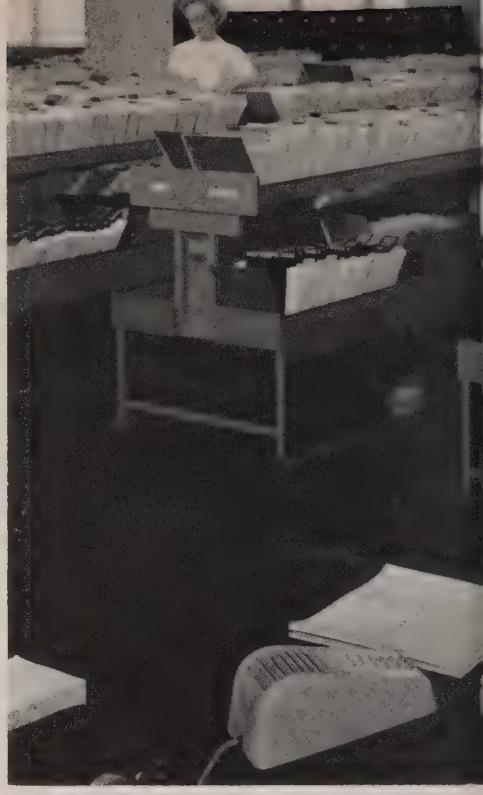
From 1 to 1,000

Orders are typed on a teletype machine, which produces a page copy and a punched tape. The tape is picked up automatically at the center in Chicago, which may handle the order or relay it to any other designation within the Ryerson organization. Order tapes are inserted into Flexowriters, which automatically produce a 10-part order set.

Different colored paper tapes are used in the Wire Communications Center to identify different plants, making it easy to check on messages.

Each message carries a number from one to 1,000 to prevent duplication in writing up orders and to provide the assurance that every message is accounted for.

Three Bellfast scanning units continually check



Using his push-button intercom (above, left), a salesman may ask the stock clerk (above, right) for the inventory level of a certain item or he may ask the central filing department (right) for important correspondence on the account. Open-shelf filing (background) will help the file clerk get whatever paperwork the salesman needs.

all plants and offices for messages. The Wire Communications Center has 18 receiving units and 18 sending units. Fifteen of each are in use and three are kept on standby.

In case of emergencies, the company can fall back on three TWX public line teletype machines (the present Bellfast system replaced a TWX system), still in service and still used with customers and suppliers who are not hooked into the private wire system.

Ryerson messages are sent by open wire, cable or radio relay. Provision has been made for automatically warning an operator, visually and audibly, when there is any trouble or when the roll of tape in a receiving machine is running low.

Chicago is linked with a number of other plants by extensive private telephone lines. The company also continues to use the services of Western Union Telegraph Co., sending about 1,000 messages a month over this system.

Through the Ryerson Wire Communications Center, some 3,000 messages are processed daily—roughly half of which are orders. Under Ruebe's direction, a supervisor, seven operators and one messenger maintain the functions of the section. Work in the communications center goes on from 7:15 a.m. to 7:15 p.m., Monday through Friday.

One of the largest installations of its kind, the Bellfast system also has been used to receive payroll information from distant points, saving a couple of days' time over mail delivery, and it has been used to alert all plants—simultaneously—about price changes.

Pneumatic tubes link the Wire Communications Center with the sales and service departments of the Chicago office. Thirty minute messenger service is given to other departments.

Rounding out the systems "package," the Ryerson computer center contains an IBM 7070-1401 installation, the first in use in the steel industry. It is housed in a climate-controlled, glass-enclosed room on the first floor of the company's new, ultramodern general office building under the supervision of Harlan White, data processing manager.

Electronic Steering Committee

Installed just this year, the 7070-1401 installation supersedes an IBM 650, the company's first electronic computer, installed in 1957. Much faster than the 650 (the 1401 is 25 times faster; the 7070, 100 times), the new system was installed on orders from a top-level Electronic Steering Committee consisting of the company's president, four vice presidents, controller, office administration director and systems and procedures manager.

Prior to the installation of the system, this committee held planning conferences with every general office group, including sales, credit, procurement, industrial relations, accounting, operating,

office management, advertising, traffic and market research, to determine the company's specific objectives.

"The investment we have made in this equipment came only after we had completed our detailed study of the costs involved and the alternative courses of action," says Merle Miller, vice president and treasurer. "We concluded that the new system would enable us to operate more economically now and, more than that, that the possible applications of the equipment in the future seemed most intriguing."

The new system will calculate Ryerson's entire payroll in two and one-half minutes, compared to four hours on the 650. It will be used for payroll, accounts payable, accounts receivable, sales analysis, sales costing and maintenance of the customer mailing list, and new applications will be added as they become feasible.

Already, 97 programs have been developed for the 1401 and 34 for the 7070. In addition, over 40 sorting operations have been assigned to the 7070. Ten million punched cards (150 22-drawer filing cases full) have been condensed into approximately 88 reels of magnetic tape.

On sounder ground

Tying in with the sales efforts of the organization, data from the sales tickets are transferred to punched cards. These are fed into the 1401, which records the data on magnetic tape.

Now in tape form, the information—along with other tapes containing operating instructions and other data—is processed on the 7070. The 7070 performs the required mathematical and logical operations, acting on pre-taped instructions. Minutes later, sales results for the week have been calculated and written on output tapes. Output tapes then may be processed through the 1401 to produce either printed reports or punched cards, as required.

"All of these innovations in office procedures are designed to provide faster, surer, more economical service to our customers," says Miller. "They're advanced, but greater advancements are yet to come. Surely it's not beyond the realm of possibility to expect that within a few years, computers and related systems and equipment will help us to locate, quickly and accurately, the nearest plant having the stock required to fill an order; to check credit; to schedule the order and to do many of the other jobs that are vital to the functions of our operating and sales team."

"The immediate effects of this equipment will be to help us do a better job of analyzing the mountains of facts and figures which accumulate in our business so that we can see exactly what has happened yesterday—last week—last month," Miller continues. "Armed with this intelligence, our managers will be on sounder ground when making decisions about what to do today—tomorrow—next month—even next year." ■

Next month . . .

RCA's Stake in The World of EDP

A quarter-century of research lies behind a bold RCA bid for prominence in the highly competitive computer industry.

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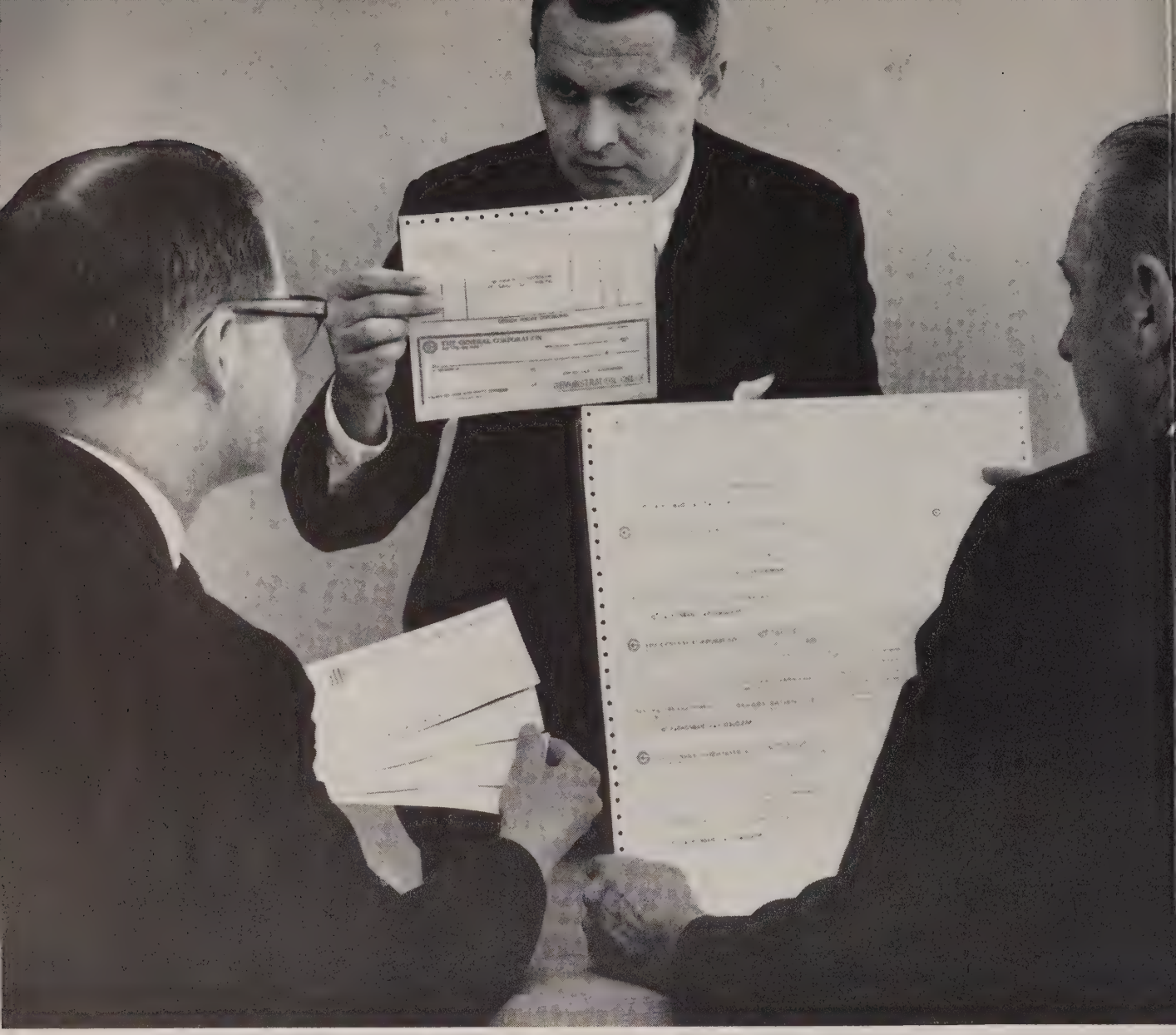
the first of a "How To" series designed to bring improved management to data processing installations.



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High-precision documents from special paper to the final printing, the new IBM paper checks are distinctive in appearance... and *always designed to make your company look its very best.*

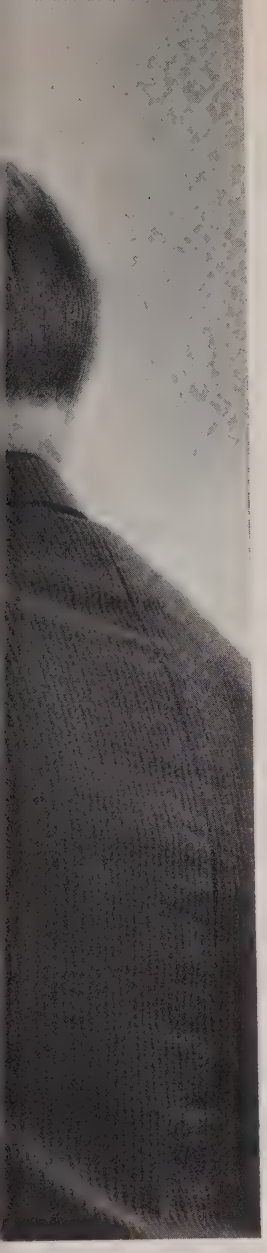
But here is the most important thing...

Your IBM supplies specialist knows exactly how paper checks are handled... and manhandled.

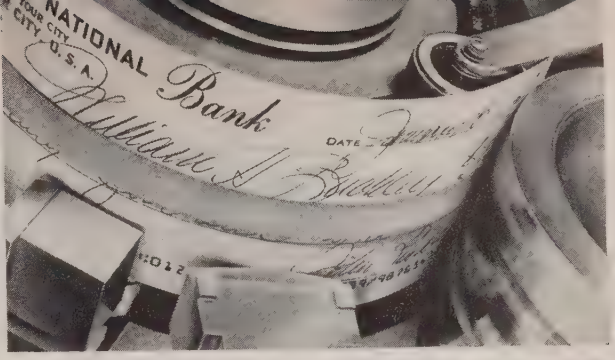
What's more, your supplies specialist is thoroughly familiar with check and data processing equipment. He helps you design the IBM paper check and stub which most economically meet your accounting demands and the capabilities of your equipment. He also offers free check design service and a wide selection of attractive check borders and backgrounds.

SAFETY—Special plant security measures safeguard your IBM paper checks during every stage of manufacturing. Special papers and printing inks protect your IBM paper checks against alteration after issue.

SERVICE—IBM supplies specialists provide prompt and expert technical assistance to you from more than 200 locations from coast to coast.



MICR IS FAST. This is the magnetic reading head of an IBM Reader-Sorter. Automatic check processing by banks means that your checks clear fast and that your cash accounting is timely.



IBM SUPPLIES SPECIALISTS get intensive training in IBM supplies and their applications. This makes them uniquely qualified to help you select the MICR checks and other supplies best suited to your operations.

HERE ARE THE FACTS. This illustrated booklet gives you the full story on IBM paper checks. To get your copy, just call your IBM office. Your IBM supplies specialist will be happy to give you a copy.

incomparable difference

GET THE FULL STORY—New IBM paper checks are available in continuous forms and in unit sets. They are processable on your own data processing equipment, as well as on your bank's MICR equipment.

Let IBM paper checks simplify your work...speed your check processing...improve your record accuracy. Let your IBM supplies specialist go to work for you. He has the facts you need to go MICR. Call your local IBM office and ask for your supplies specialist.

And the next time you are in the market for *any* IBM supplies, talk to the IBM supplies specialist. He's an expert backed by experts—a man who can show you how IBM supplies can help you improve the return on your data processing investment.

**Magnetic Ink Character Recognition. (Note: New IBM MICR paper checks are unconditionally guaranteed to meet all ABA specifications for MICR checks.)*

IBM®
DATA PROCESSING

To prepare a paper offset master using the Ektalith method, the operator places original copy on copying board.

A holder containing Kodak Ektalith transfer pape loaded in a standard copying camera and exposed.

Company Saves $8,000 a Year With New Offset Process

IN WINDSOR LOCKS, Conn., the Hamilton Standard Division of United Aircraft Corp., a leading manufacturer of aircraft propellers and jet equipment, has been able to save $8,000 a year through the use of the Ektalith process for producing low-cost paper offset masters.

"Before we switched to the new method," says Lawrence M. Baldwin, general office manager, "we were virtually limited to line work. Halftones, solids and bold headings in our copy had to be sent to the photo lab, where a negative had to be made before our photographic metal plates could be prepared. Now, we can copy practically any printed, typed, written or drawn material in virtually any color.

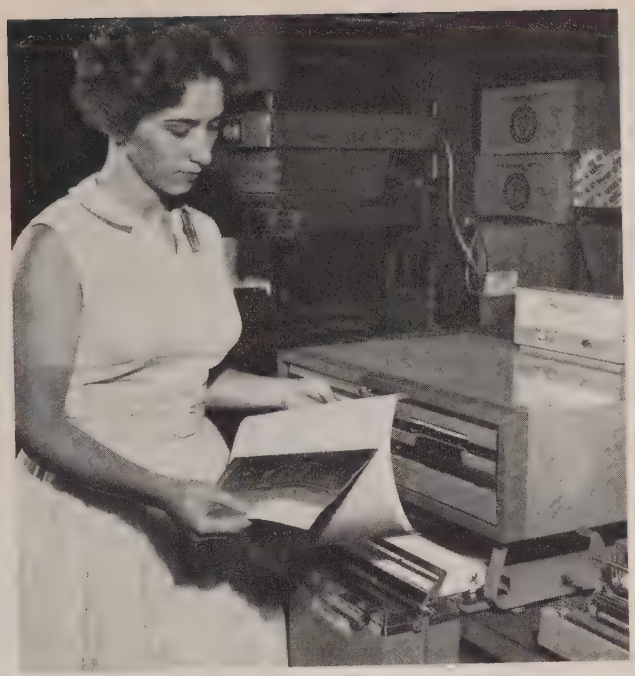
"Since half of our work involves paste-ups," Baldwin continues, "we lost additional time under our old system due to the necessity for cleaning unwanted shadow background from the plates. This involved an average of 10 minutes per plate. Now, our masters require little or no clean-up and are easy to correct or change prior to printing."

Before adopting the improved process, a development of the Eastman Kodak Co., Hamilton Standard always had a two-day backlog of work. Since the change, one operator handles the preparation of all plates—an average of 200 per day—in half a day's time. This allows the department to utilize the operator at one of the offset presses during afternoon hours. Including materials, labor and overhead, the savings has amounted to some $30 a day. An additional savings of $500 a year has resulted from a 75 percent reduction in the use of photographic metal plates.

An example of the way in which Hamilton Standard has benefited from the speed, efficiency and economy of Ektalith was shown recently when —at 12:30 p.m.—Baldwin received a disquieting assignment:

"Here's a 100-page engineering proposal of great importance to the company. Twenty-five copies must be in Boston by 4:30."

An airplane was standing by. The office staff swung into motion.



Processed transfer paper is lined up with a paper offset master, brought into contact and then stripped away.

Final master, with copy reduced approximately 35 percent, is inspected by section leader Michell Raffia.

In less than an hour, 100 offset masters were finished. In another hour, the necessary 2,500 pages of material had rolled off the department's four offset presses, been collated into 25 copies of the engineering proposal and been rushed to the plane. The plane left at 2:30 p.m., in plenty of time to make the Boston deadline.

One of the company's larger printing jobs is the preparation of the company telephone directory, a 32-page booklet changed every four months. There, the "original copy" is a metal panel containing a series of overlapping cards, each with a typed name and phone number. The preparation of pre-sensitized metal plates for this directory used to take two to three days; now, paper plates are prepared in about three hours.

All of the company's 8½x11-in. and 8½x14-in. internal forms (excluding snap-out and continuous forms); memos; sales brochures; technical catalogs; parts lists; engineering proposals; and manuals on drafting, materials standards, metallurgy and inspection procedures are produced by the Duplicating Department.

Many 5x8-in. forms are used by the company, also, and these are printed, two at a time, on standard 8x10-in. paper.

With Ektalith, only one original is required. The original is positioned, photographed, repositioned and re-photographed. Formerly, two copies of the original were needed, involving an additional hour's time at the drawing board and another at the typewriter.

Since 5x8-in. forms are printed about six times a week, this savings in time amounts to roughly 48 hours per month.

Recently, top management wished to rush an urgent communication to its 8,000 employes and the Duplicating Department was asked to make sure that copies of a six-page letter were in the mail that night. Copy was received at 2:45 p.m., six offset plates were ready in six minutes, and in two hours, the required 48,000 letter-pages had rolled off the presses.

"The new method is extremely fast," says Baldwin. "One operator can produce a paper master a minute; or, in cases of emergency, one operator at the copy camera and one at the processor can increase the rate to one every 30 seconds."

Using a standard copying camera and a desktop Ektalith loader-processor, a paper plate can be prepared in less than two minutes and does not require a darkened room. The process involves (1) exposure of the original document to a sheet of special transfer paper, (2) the processing of the transfer paper and (3) the transfer of the photo image to a paper master (see illustrations).

Nine thousand copies have been reproduced by Hamilton Standard from one offset master, and Baldwin says another 10,000 copies could have been made without any loss of quality. ■

Stores Collect Sales Data on Punched Tags

Willoughby's is called "Photographic Headquarters of the World

INFORMATION on credit purchases, clerk's performance, inventory levels, sales trends and other important merchandising statistics is being gathered at the point of sale and used to good competitive advantage by Willoughby's, 65-year-old New York City retail photo supply store.

Up-to-the-minute data from Kimball punched tags and the keyboard of Monroe-Sweda cash and data recording registers is helping store management to keep constant control over its highly competitive and rapidly-changing business.

Small pre-punched tags, which contain fixed product data such as item identification and list price, are kept in small cannisters next to the item on sale. As a clerk makes a sale and reaches for the item, he also picks up one of the corresponding punched tags.

The tag is inserted in the cash register and variable data such as clerk's identification, department number and actual sales price (photo supplies are subject to a wide range of discounts) are punched on the tag and printed on the sales slip as the sale is recorded. Punched tags go into the register and are automatically stacked in a locked cannister inside the machine.

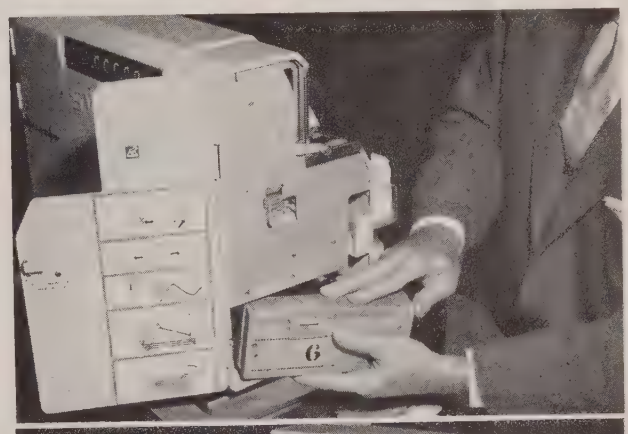
At the same time, similar information is recorded on a printed tape inside the machine. This tape is used at the end of the day to yield cash, credit, trading, federal tax, sales tax, merchandise, delivery charge and deposits totals.

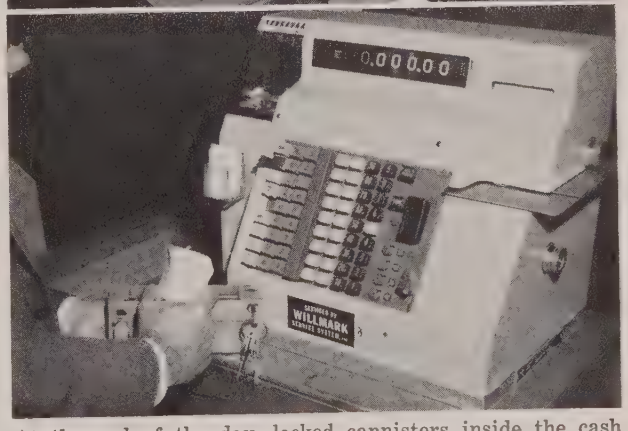
The cash register will not work and the clerk cannot close the sale unless the punched tag has been inserted; nor will it operate unless the register has made its entry onto the tag, the sales slip and the paper tape.

Punched tags are removed from the locked cash register cannisters at the end of the day and are forwarded to the main office for processing.

In the main office, the tags are read by a Kimball tag reader and converted to punched cards by an IBM summary punch. The cards are processed to produce totals similar to those recorded on the cash register tapes. Card totals and tape totals are cross-checked to assure accuracy.

As clerk rings up a sale, cash register records data that will enable management to analyze sales statistics.





At the end of the day, locked cannisters inside the cash register are removed (top) and day's accumulation of tags taken out (bottom) for machine processing.

The following morning, tabulations and analyses of the day's business are run off and the information is immediately made available to management. This allows management to reorder and replenish the store's stock, tally sales commissions by clerk and study sales statistics according to department, item or other available criterion.

Prices can be adjusted according to the previous day's sales trends. Slow-moving items can be "specialed" and fast-moving items can be replenished at suitable price levels.

Previously, many of these decisions had to be based on little more than personal judgment. Often, it took too long to gather statistics from hand-written sales slips to allow management much of an opportunity to use them properly. Potential statistical information often proved unusable because sales slips had not been filled out completely or accurately.

On the sales floor, the old method caused wasted time, inaccuracies through clerical error and frustrating delays for customers. A clerk was assigned

Punched tags are processed through the tag reader and an IBM summary punch to produce punched cards, which become input to the firm's tabulating machines.

Morton Weitz (standing), Willoughby's director of research, and David Riebenfeld, purchasing agent, plan inventory replenishment from machine-processed data.

exclusively to a specific department and was forced to prepare an itemized, hand-written sales slip for every sale. All sales slips then were processed through a central cashier.

Now, clerks can devote nearly all of their time to selling; the transcription and calculation chores of filling out sales slips have been taken over by the cash register.

Clerks can leave the counter and accompany their customers throughout the store, providing more personalized service. This has helped Willoughby's to increase the size of its unit sale, because the old method induced customers to buy an item, pay for it and leave, whereas the new system encourages store-wide shopping. Final sales now can be recorded at any of the 12 cash registers scattered throughout the store.

By allowing the clerk to leave his department, the new system permits him to suggest add-on sales in other departments and to follow through with the customer until the very end. Impulse buying has increased correspondingly.

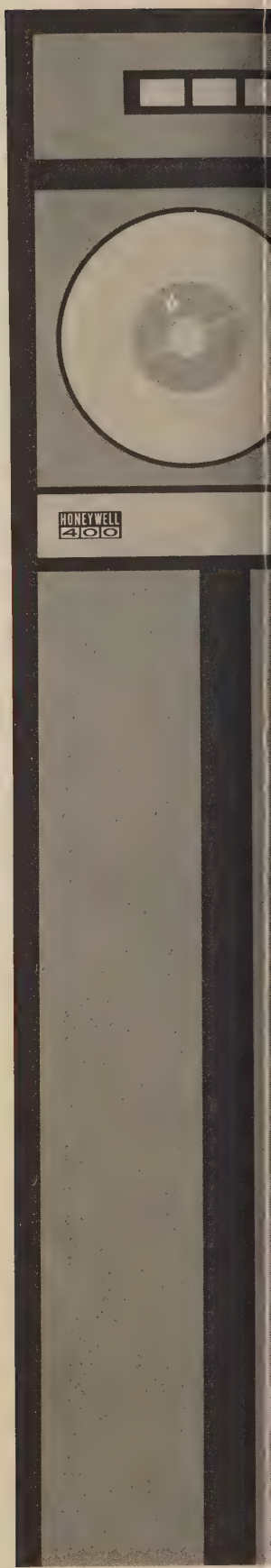
Willoughby's is owned by Grayson-Robinson Stores, Inc. Although it is the only photo supply store in the group, it is not the only store using the punched tags and other equipment. All Grayson-Robinson stores use the equipment in a similar fashion and all retail reports are kept separate by code numbers assigned to each outlet. ■

HONEYWELL 400

DON'T SPEND $5,000 OR MORE A MONTH ON DATA PROCESSING WITHOUT TAKING A GOOD LOOK AT

HONEYWELL 400

ELECTRONIC DATA PROCESSING SYSTEM



TAKE SPEED *Internal speed of Honeywell 400 is 10,000 three-address operations (equal to 20,000 single-address operations) per second. Magnetic tape transfer rate is 96,000 decimal digits per second. Input speed is 650 cards per minute, and you can have on-line or off-line printing at 900 120-character lines per minute.*

As a practical example of Honeywell 400 speed, a file of 10,000 50-character items can be sorted in less than four minutes (with a four-tape system), a file of 200,000 insurance policies can be updated in 17 minutes, or a 10,000-man payroll can be completed in less than two hours.

TAKE RELIABILITY *Honeywell 400 magnetic tape units handle their tapes so gently that Honeywell guarantees to replace any of its tapes should they become worn out or damaged during processing.*

Orthotronic Control, another exclusive Honeywell feature, protects valuable records by automatically reconstructing lost or damaged data. Most systems detect errors, only Honeywell systems can also correct them instantaneously, and without human intervention.

TAKE EFFICIENCY *One of the most important advantages of Honeywell 400 is its ability to conduct many operations simultaneously. In addition to simultaneous tape read-write, non-peripheral central processor operations may continue between interpretation of the card-read instruction and the beginning of data transfer. Similar interweaving is possible during card punching operations. A print-storage option permits high-speed printing without limiting in any way the operation of the rest of the system.*

Unlike any other system in its price range, Honeywell 400 can accept data on a full-time basis from external sources, such as communication units, while simultaneously carrying out a regular data processing operation.

Every Honeywell 400 includes an extensive package of programming aids. In addition to full indoctrination and training of your programmers, Honeywell provides a highly efficient program assembly system called EASY. The industry-wide compiler, COBOL, is also being implemented for Honeywell 400. Other programming aids include an algebraic compiler, a library of basic routines, and special techniques for testing programs and maintaining program tapes.

TAKE A LONG HARD LOOK *Dollar for dollar we'll stack Honeywell 400 against any system you can name on any job you have in mind. The detailed specifications on the following page will provide a preliminary basis for comparison. The only true measure, however, is how well Honeywell 400 performs in meeting your specific requirements. For more information, contact your nearest Honeywell EDP sales office (listed on the following page).*

HONEYWELL 400 PERFORMANCE SPECIFICATIONS

CENTRAL PROCESSOR

- *Memory Capacity — 12,288 digits (8,192 characters)*
- *Speed — 10,000 three-address operations per second*
- *Simultaneous read-write*
- *Built-in checking*
- *Index registers*
- *Extensive automatic editing capability*

CONSOLE

- *Input keyboard*
- *Output character printer*
- *Status indicators*

CARD READER

- *Speed — 650 cards per minute*
- *Cards — standard 80-column*

PRINTER

- *Speed — 900 lines per minute*
- *Horizontal Span — 120 print positions*
- *Number Carbons — up to 10*
- *Lines per inch — six*
- *Number of characters — 26 alphabetic, 10 numberic, 20 special symbols*

MAGNETIC TAPE UNITS

- *Information transfer rate — 96,000 digits per second*
- *Simultaneous read-write*
- *Variable-length records*
- *Number units on-line — three to eight*
- *Rewind speed — 360 inches per second*
- *Orthotronic Control file protection*

OPTIONAL EQUIPMENT

- *Card punch — 100 cards per minute*
- *Card punch — 250 cards per minute*
- *Additional memory — 12,228-digit modules up to total of four*
- *Paper tape input and output units*
- *On-line operation of non-Honeywell magnetic tapes*
- *Multiply divide option*
- *Printer with 160 print positions*
- *Off-line printing configuration*
- *Random access disc storage*
- *Optical scanning input*
- *Data transmission*

Honeywell

Electronic Data Processing

CHOICE OF DISCRIMINATING USERS

Honeywell EDP Sales Offices

ALBANY
45 Colvin Avenue
Albany 6, New York
Phone: IVanhoe 9-2546

ATLANTA
500 Plasters Avenue, N. E.
Atlanta, Georgia
Phone: TRinity 5-9561

BOSTON
60 Walnut Street
Wellesley Hills 81, Mass.
Phone: CEdar 5-7450

CHARLOTTE
212 Greystone Road
Charlotte 9, North Carolina
Phone: JAckson 3-6516

CHICAGO
77 South Wacker Drive
Chicago 6, Illinois
Phone: RAndolph 6-9206

CINCINNATI
7645 Production Drive
Cincinnati 37, Ohio
Phone: POplar 1-4500

CLEVELAND
1001 East 55th Street
Cleveland 3, Ohio
Phone: UTah 1-0300

DALLAS
6000 N. Central Expressway
Dallas 6, Texas
Phone: EMerson 8-6401

DENVER
2130 S. Dahlia
Denver 22, Colorado
Phone: SKyline 6-8802

DETROIT
Fisher Building
Detroit 2, Michigan
Phone: TRinity 2-5855

HOUSTON
5440 Gulf Freeway
Houston 1, Texas
Phone: WAlnut 8-2451

INDIANAPOLIS
1905 W. 18th Street
Indianapolis, Indiana
Phone: MElrose 5-4591

KANSAS CITY
4650 E. 50 Highway
Kansas City 30, Missouri
Phone: WAbash 3-8725

LOS ANGELES
1017 Wilshire Boulevard
Los Angeles 17, California
Phone: HUntley 2-1830

MINNEAPOLIS
600 Second Street, North
Hopkins, Minnesota
Phone: WEst 5-1731

NEW YORK
One Rockefeller Plaza
New York 20, New York
Phone: CIrcle 6-2500

PHILADELPHIA
301 City Line Avenue
Bala-Cynwyd, Pennsylvania
Phone: TRinity 8-3300

PITTSBURGH
4120 Brownsville Road
Pittsburgh 27, Pennsylvania
Phone: TUxedo 2-9700

RICHMOND
2101 W. Laburnum Avenue
Richmond 27, Virginia
Phone: ELgin 3-4431

SAN FRANCISCO
2 Dorman Avenue
San Francisco 24, California
Phone: ATwater 8-0118

SEATTLE
401 Pontius Avenue
Seattle 9, Washington
Phone: MUtual 2-5610

UNION, NEW JERSEY
U. S. Route 22
At Springfield Line
Phone: MUrdock 8-9000

WASHINGTON, D. C.
1801 N. Moore Street
Arlington, Virginia
Phone: JAckson 4-8200

MONTREAL
Honeywell Controls Limited
Electronic Data Processing Division
6277 Upper Lachine Road
Montreal 28, Quebec
Canada
Phone: HUnter 4-3501

TORONTO
Honeywell Controls Limited
Electronic Data Processing Division
Vanderhoof Avenue
Leaside
Toronto 17, Ontario, Canada
Phone: 489-2151

Jantzen's eight data input work stations each consist of a key punch and visible punched card file.

Jantzen Ends Order Tie-Ups

THE MANUFACTURE of sports wear is a very seasonal business with pronounced "peaks and valleys" of order processing activity; however, Jantzen, Inc., Portland, Ore., has devised a punched card order processing system that offers the necessary flexibility to operate effectively, even under these extreme conditions.

The Jantzen system involves eight order processing work stations, each a self-contained "subsection" consisting of an IBM card punch and a VISIrecord punched card tub file. Punched cards are the input to Jantzen's IBM 1401 computer.

Incoming orders go first to an order analyst, who codes and reviews each one before breaking the batch down according to state groupings. The order analyst then passes the orders along to the appropriate work stations. Each work station processes the orders for a number of states.

The work station operator takes the incoming order and turns to her tub file, which contains up to 3,000 master card sets on accounts within the states to which she is assigned. Master card sets consist of cards with name and address data, plus additional cards for any special account instructions, such as those requesting that shipment be made to one address and billing to another.

In the operator's tub file, sectional dividers separate master card sets according to city, state or other regional categories. Flipping the file dividers to the appropriate section, the work station operator sees a bank of master card sets, each offset slightly so that it will show the information contained along its top edge. Within three seconds, the operator can select the correct master card set from the file.

The master card set, consisting of two to six cards, is run through the card punch for reproduction and then returned to the file. To complete the order heading operation, an order master card containing all the specific order information (requisition number, terms, etc.) is punched.

After that, the operator punches line item detail cards, using data from the salesman's original order. These detail cards show such information

Upon receipt of order, clerk selects proper master card set to head order processing information, then runs cards through punch for reproduction.

After header information is punched, clerk punches item detail cards showing style, color, size, quantity, etc. from salesman's order.

as style designation, delivery date, color code, size range and quantity, but require only a limited number of coded numeric keystrokes to produce. Using code numbers to indicate each of these pieces of information, operators gain maximum speed.

Header cards, order master cards and line item detail cards go directly to the computer for processing. Product descriptions are stored in the computer's memory. Input is spot-checked to maintain accuracy.

"The maintenance of these master card files at each of our individual work stations has helped us to eliminate the 'crisis' during overload periods," says James J. Anderson, data processing manager. "Work station operators can locate basic customer information quickly and can reproduce it onto input cards equally as fast.

"When incoming orders reach the point of overflow, we divert the preparation of the line item detail cards to other card punches normally used in other operations. Our work stations then concentrate exclusively on the preparation of order master cards and the reproduction of master card sets from our tub files."

Rapid access to master card sets in the VISIrecord tub file helps to eliminate idle card punch machine time.

This flexible operating procedure allows Jantzen to level off the workload created by a varying

Master card sets are returned to the tub file in easy-to-read, on-end, overlapped position.

volume of orders that may range from 10,000 to 20,000 per month.

"Last year, Jantzen reached a sales volume of $55 million—13.4 percent over 1959," says Anderson. "Our flexible order processing system has been able to take up the added volume nicely, and by enabling us to consolidate several data input functions, it actually has cut two days off the lag time between order entry and completed data processing that we had using previous methods." ■

The all-new DITTO®

MASTERFAX™

does 4 jobs in 1!

1 **MAKES SPIRIT MASTERS IN 15 SECONDS,** without a typing carbon, from original copy on Masterfax paper —also from newspapers, letters, business forms. Eliminates retyping, rewriting, redrawing.

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3 **MAKES LOW-COST FACSIMILES** from any original: newspaper clipping, letterhead, business form. Also, from image on Masterfax paper, makes copies on any weight, grade of paper—even cloth!

4 **PLUS FEATURE—IT LAMINATES!** Covers papers, documents with tough, plastic coating. Protects against dirt, age, handling. Enhances appearance of papers. Costs only pennies!

FOR FULL DETAILS AND DEMONSTRATION call your local DITTO Sales Representative, or mail coupon.

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Gentlemen: Without obligation, please—

☐ Send me full particulars on the amazing new DITTO MASTERFAX.

☐ Have your Sales Representative arrange a demonstration.

NAME, TITLE_____

COMPANY_____

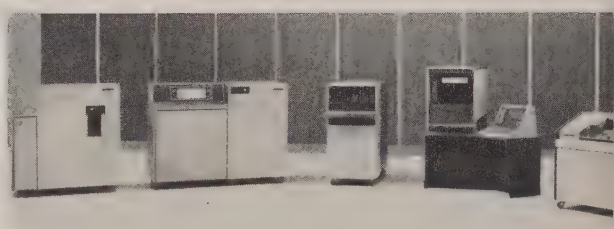
ADDRESS_____

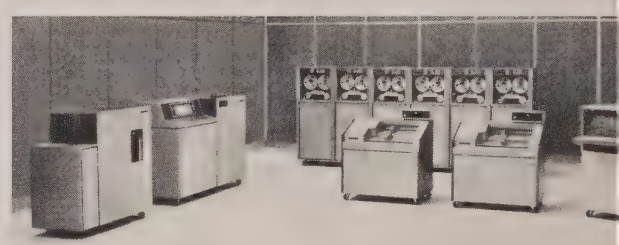
CITY_____ ZONE____ STATE_____

For More Information Circle Reader Service Card No. 162

Product Preview

Burroughs Enters Punched Card Computer Field





BURROUGHS Corp. has entered the punched card computer business with four newly-introduced electronic systems comprising the Burroughs B200 series.

According to Ray R. Eppert, president, the equipment will be augmented with an expanded customer training program, a sizeable increase in the company's sales and technical forces and a manufacturing program utilizing the firm's four plants in Detroit and in Pasadena, Calif.

The four Burroughs systems include:

The B270 (top) reads and sorts MICR encoded documents, providing a tape listing of the items in each pocket of the sorter. It also captures data on magnetic tape for subsequent computer input. A typical system would include a card reader, central computer, printer and six magnetic tape units.

The B250 (top, right) combines high speed punched card data processing with traditional ledger cards. Typical systems will include a central computer, record processor, card reader, card punch and printer.

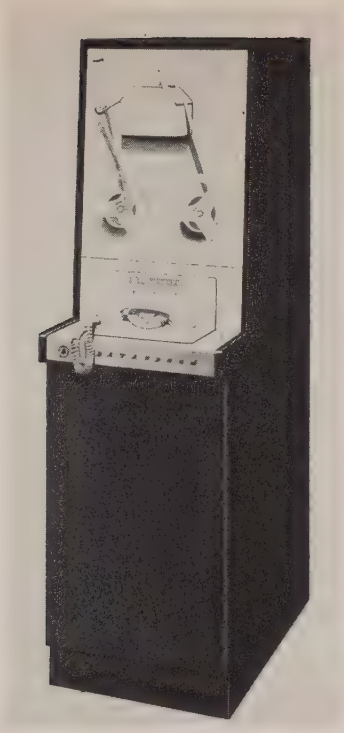
The B260 (center, right) can accomplish many of the collating, calculating, summarizing, summary punching and printing operations in a single run. A maximum system would include a central computer, two card readers, card punch and printer.

The B280 (bottom, right) adds the high speed of magnetic tape to the B260 system. It can be used as a low-cost magnetic tape data processing system or as an off-line system performing peripheral functions for other medium or large-scale computers. Maximum systems would include a central computer, two card readers, card punch, printer and six magnetic tape units.

Burroughs' B200 central computer has 4,800 character positions, alphanumeric core storage, with each position individually addressable. Each position contains seven bits and the computer features odd-bit parity checking. Instruction fields are 12 characters in length, with a maximum of about 24 instructions for one system at one time.

Peripheral equipment consists of the B421 magnetic tape unit, B321 printer, B124 card reader, B304 card punch, B401 record processor, B322 multiple tape lister and B100 series sorter-reader.

Circle No. 135



Dataspeed sender.

Dataspeed receiver.

Product Preview

Bell Dataspeed Is Ten Times Faster Than Present Teletype

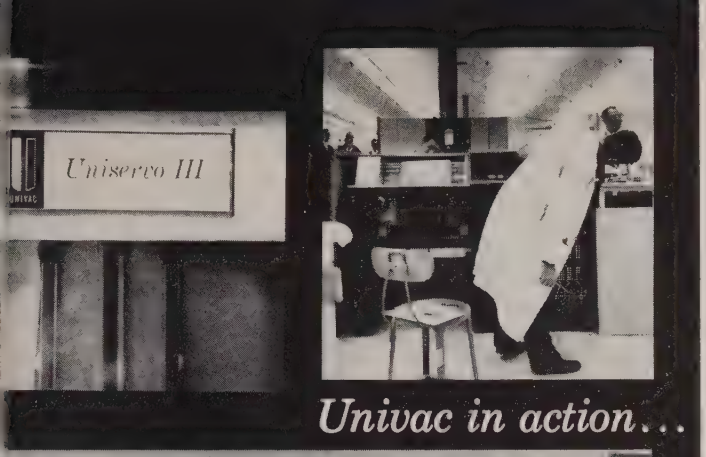
HIGH-SPEED punched tape transmission equipment capable of handling 1,050 words per minute is soon to be introduced by the Bell Telephone System. Bell's Dataspeed service is 10 times faster than the exchange teletypewriter transmission equipment now in use.

Available in two types—Type 1 for five-level tape only and Type 2 for five to eight-level tape—the Dataspeed equipment will be manufactured by Teletype Corp., a Western Electric subsidiary. Type 1 will be available by the end of the year; Type 2, during the first quarter of next year. The company says equipment with error detection and automatic correction features will be introduced in late 1962 or early 1963.

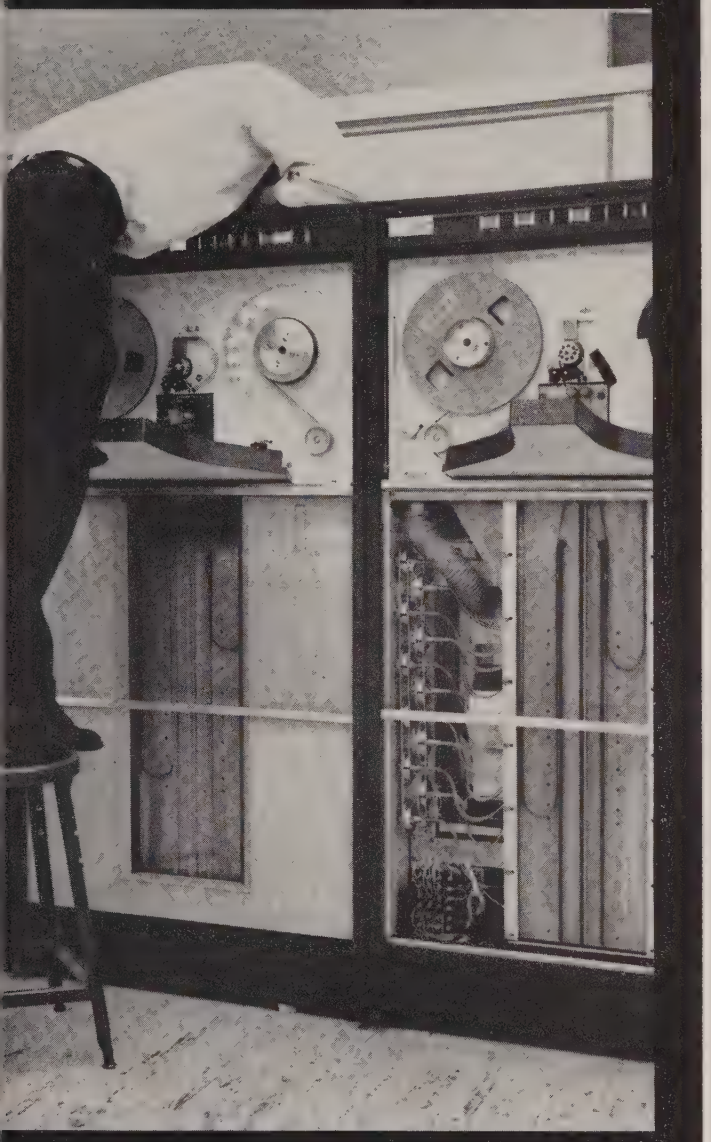
Dataspeed senders (left) and receivers (right) also can use Data-Phone service over ordinary telephone lines at long distance rates. Data-Phone units may be built into the push-button operated units. The tape-to-tape senders and receivers have a capacity of 105 characters per second.

Typical uses for the service will include centralized payroll processing for multi-unit operations; centralized record keeping for widely scattered operations; large volume transmission of letters, reports and other page copy; and centralized computer service for a number of outlying branches.

Installed and maintained by Bell, Dataspeed equipment will measure 15x48x24-in., offer transistorized circuitry and be made available to users on a lease basis. Circle No. 129



Univac in action...



Countdown on Univac III—the world's most powerful large-scale business computer

This is UNIVAC® III. In November 1961, this new computer completes systems test and goes "on the air" as an operating system—ahead of schedule. *Ahead of schedule* because of automated development techniques* perfected by Univac.

UNIVAC III provides more output at lower unit cost than any other system available today. Renting from $18,000 to $22,000 a month, it delivers more power than computers in the $30,000 to $40,000 class!

Its central processor contains enough main memory storage for a program of up to 32,768 commands. And it takes only 4 microseconds—one million times faster than you can read this sentence—to complete a computer cycle. Add time? 8 microseconds.

Need mass storage for large-scale batch data processing? Up to 32 new Uniservo III tape units can be used to meet your requirements. A new character packing technique permits you to store 48 million digits on a single reel of tape—over a billion and a half digits in all.

Looking for speed? This new Uniservo III tape can be read and written at the rate of 200,000 digits per second. Fully modular, UNIVAC III can handle four of these tapes concurrently—*800,000 digits per second.*

Want easier operation? With UNIVAC III, there's a minimum of operator intervention, a minimum of tape change-over. For example, you can read, write, and compute concurrently with up to 8 different input-output operations. A unique multiple program-interrupt feature assures their compatibility.

UNIVAC III also provides "open-end design." Its 8 general-purpose, bi-directional channels can accommodate any new or improved peripheral equipment, on-line or off. They won't compete with the computer.

You get simplified programming, too. A variety of automatic coding techniques is available to suit your needs.

A continuation in design concept of the incomparable LARC computer, UNIVAC III brings you economy and flexibility, accurate performance and high computing speeds. Because of this advanced logical design, UNIVAC III memory can be made to handle bigger jobs if your future needs require it. You just add the necessary memory module.

Only with UNIVAC III will you find all these advantages combined in a single system. Why not call your Univac representative for full details?

*UNIVAC I was used to design, test and prepare all diagnostic programs as well as for backboard wiring layouts during development of UNIVAC III. Software and hardware were produced simultaneously . . . a major factor in the accelerated schedule of this powerful new computer.

UNIVAC

DIVISION OF SPERRY RAND CORPORATION

Foot-operated switch on the bottom of the new IBM reader-sorter halts machine for hands-free removal of documents.

Improved Reader-Sorters Are for Bank Use

Product Preview

TWO IMPROVED reader-sorters that can process up to 1,600 checks per minute or 1,960 postal money orders per minute are available from International Business Machines Corp.

The IBM 1419 magnetic character reader (shown above) feeds checking account information directly into a computer; the IBM 1219 is used for processing independent of a computer.

By linking the 1419 to a 1401 computer provided with the new Processing Overlap feature (which permits the reading and sorting of documents by the 1419 without tying up the central processing unit of the computer), the user increases the computer's capability in demand deposit (or check accounting) functions by as much as 30 percent and in transit functions by as much as 70 percent.

Seventy percent faster than previous IBM reader-sorters, the two new machines gain added speed by reducing the amount of space between documents rather than by simply increasing the speed at which they move through the machine.

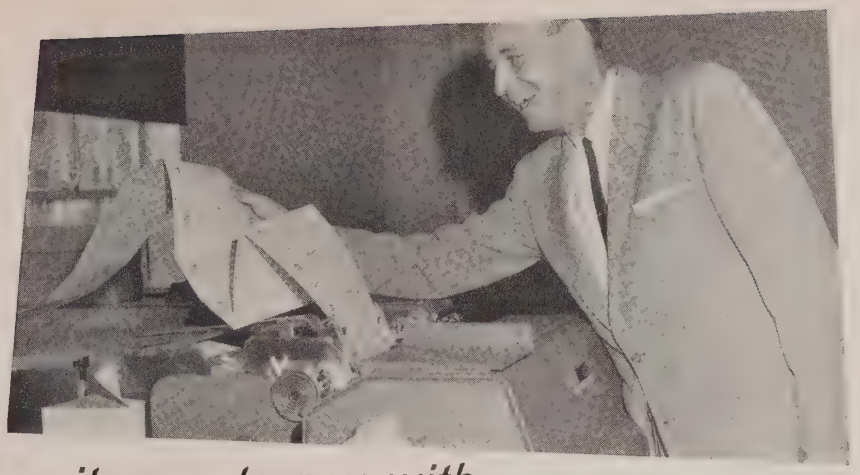
Another feature of the units is eye-level controls, mounted at a 45-degree angle at one end of the machine and visible from any position.

Lights indicate when a check pocket is nearly full and needs attention, allowing the operator about one minute to reach the pocket before the machine automatically turns itself off. Both machines offer electronic jam protection.

Either machine can process documents between 2¾-in. and 3⅔-in. in width; 6-in. and 8¾-in. in length; .003-in. and .007-in. in thickness; printed on stock from 20-lb. short grain to 44-lb. card stock.

The 1419 rents for $2,275 a month and costs $110,500; the 1219, $2,025 a month and $102,100; and Processing Overlap, $250 a month and $15,000. Delivery is made in 16 to 18 months after the order is received. Circle No. 110

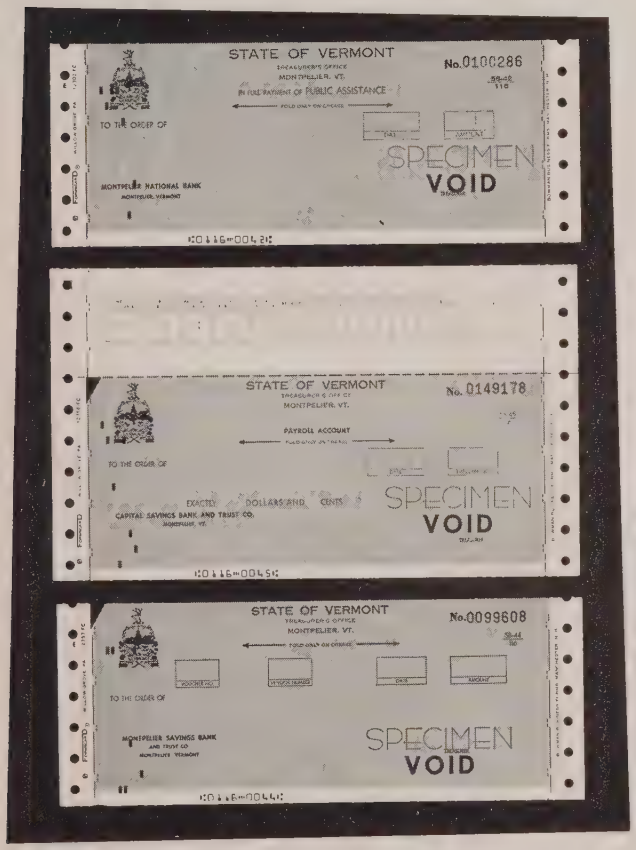
take it from the Governor of Vermont:



it pays to pay with

FORMSCARD®

still the only continuous tab card with NO medial waste strips



The Honorable F. Ray Keyser, Jr., Governor of the State of Vermont, notes with interest the use of FORMSCARD checks by his Central Data Processing Unit. Checks issued by Vermont's Treasurer's Office, for Payroll, Public Assistance and General Use, are all on FORMSCARDS, allowing for vouchers of any length; side, top or bottom.

Other unique FORMSCARD features include pre-punching, trouble-free feeding at any speed and easy separation manually or on any burster. FORMSCARD can be part of multiple part sets.

call, write or wire

Forms inc

WILLOW GROVE, PA. Phone: Oldfield 9-4000

Manufacturers of line-hole continuous business forms.
Samples on request—sales representatives in principal cities.

For More Information Circle Reader Service Card No. 184

Modular data integrator produces a perforated tape that is acceptable to other business machines.

Record-A-Matic data recorder is used for payroll functions.

Product Preview

American Offers Data Recorder, Integrator

Two data processing machines—an attendance recorder and a data integrator—now are being manufactured by American Data Machines.

The Record-A-Matic printing and punching attendance recorder (right) is designed for collecting the necessary data for weekly payroll operations. In use, the employe selects his pre-printed time card from an "In" rack next to the machine and places it in a card-feeding device on the top. The card is carried inside the unit for printing and punching and then automatically returned to the top of the machine, where the employe retrieves it and transfers it to an "Out" rack.

Output of the Record-A-Matic is a visual Hollerith code punch card, which is direct input to any data processing system. The machine will punch three columns for "in" time and three columns for "out" time. A manual handle determines "in" and "out" printing and punching.

Time is punched according to a 24-hour clock, with minutes divided into tenths. Print wheels are positioned so that all printed digits fall between the punched columns. A microswitch prevents cards from being entered in a reverse position.

Provisions have been made for a seven-day work week for purposes of flexibility. The attendance recorder measures 16x28x11-in. and is easily affixed to any wall.

The modular data integrator (left) combines fixed, variable, identification and time and account data on a "common language" perforated tape acceptable to business machines, tabulators and computers. By adding or subtracting modular units, the user may step up or reduce the capacity of the system according to his needs.

Easy to operate, even by untrained personnel, the integrator accepts any existing punched cards. All identification and fixed data are entered automatically.

Five-channel tape output may be replaced by six, seven or eight-channel tape, if desired, providing added flexibility. Circle No. 109

Just push the button . . . get a print in seconds

Announcing . . .

the RECORDAK READER-PRINTER

For fast, convenient reference to microfilm and printmaking whenever needed

In seconds the versatile RECORDAK Reader-Printer gives you a sharp and photo-exact paper copy of any document on 16mm or 35mm microfilm, whether in roll form, acetate jacket, or aperture card.

Operation is completely automatic from the instant Print Button is pushed. Nothing further to do but pick up the trimmed, ready-to-use print of the projected microfilm image. Cost is about 9¢ for photographic paper and chemical used.

Special features of the new RECORDAK Reader-Printer add versatility to its speed and convenience. For example:

- Microfilm images can be viewed right side up regardless of how they are positioned on the film, thanks to Reader Head which can be rotated full 360°.
- Full line of accessory lenses of magnifications between 11x and 34x—interchangeable in seconds—is available. The RECORDAK Reader-Printer comes equipped with one lens of your choice.
- *One-year service at no extra charge . . .* an important Recordak extra that's backed up by a skilled, nationwide service organization.

RECORDAK®

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming—
now in its 34th year

IN CANADA contact Recordak of Canada Ltd., Toronto

MAIL COUPON TODAY

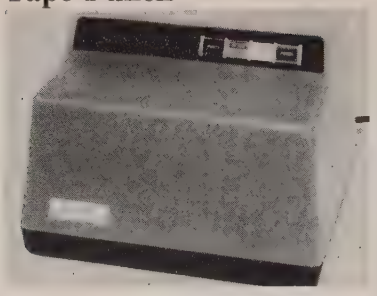
RECORDAK CORPORATION SS-10
415 Madison Avenue, New York 17, N. Y.
Gentlemen: Send details on new Recordak Reader-Printer.

Name_____
Position_____
Company_____
Street_____
City_____ State_____

For More Information Circle Reader Service Card No. 165

Business Automation Showcase

Tape Punch



Systematics' Model P76 tape punch will punch five, six, seven or eight-channel paper or Mylar-aluminum tape at the rate of 20 characters per second. Soundproofed 3/16-in. enclosure of cast aluminum reduces noise level to less than that of an electric typewriter. Features include a power-operated back space; an enclosed, jam-proof chad disposal box; and completely enclosed tape supply (1,000-ft.) and take-up (400-ft.) reels. The P76, which measures 15 x 21 x 14½-in., is standard equipment on all Systematics tape punching systems. Circle No. 122

Control Pedestal

Anelex Corp. has produced a new control pedestal for its Series 4-1000 high-speed line printer which houses all of the electrical and electronic components ordinarily associated thereto. Solid state hammer drive circuitry, power supplies and power sequencing units and contained and buffering and logic may be added. Of modular construction, the pedestal features power and fuse failure alarms. The unit requires no special installation. Circle No. 118

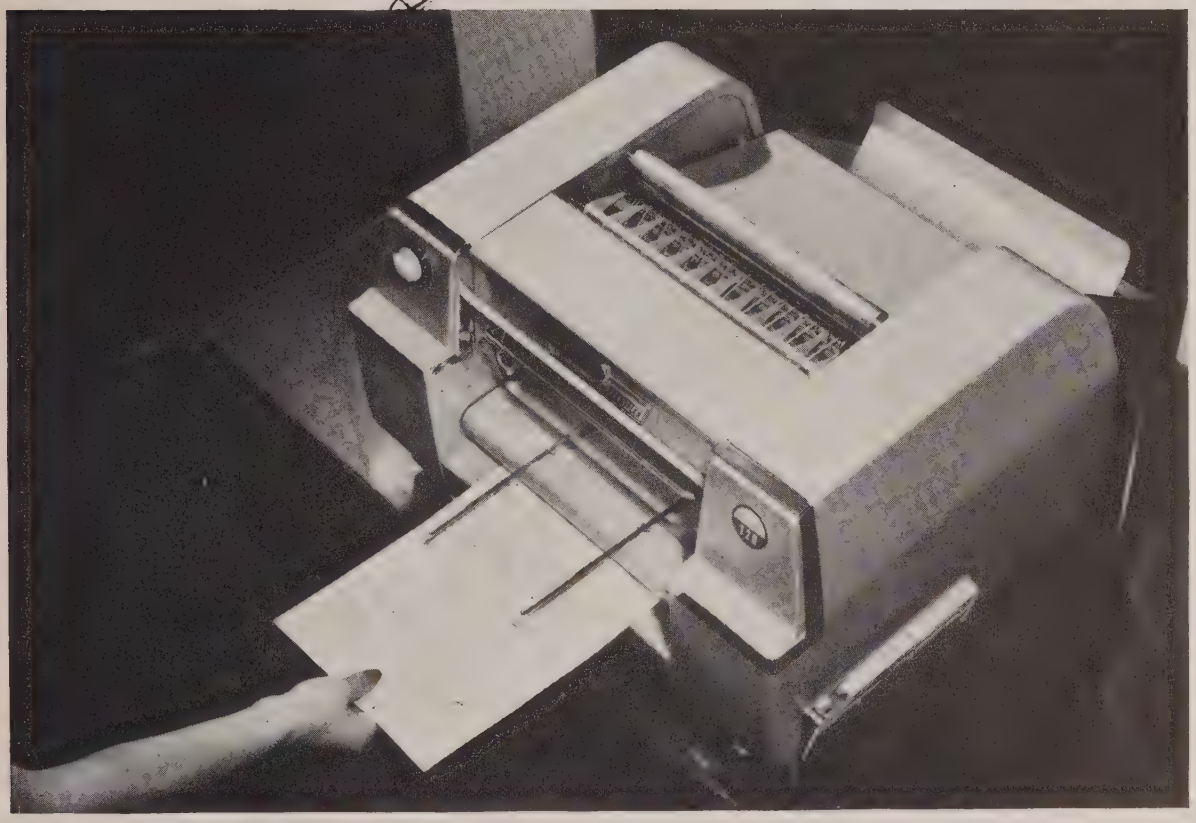
Parallel Communications

A low-cost parallel communications system for rapid transmission of data through regular local or long distance dial telephone networks is produced by Tally Register Corp. Developed for use with Data-Phone service, private wire networks or leased lines, the unit eliminates all character indexing, serializing, receiver recognition and data assembly processes. Offered in three versions: Mark 1 consists of simple data transmission and reception, and Mark 2 and 3 consist of combination receive and transmit systems, with error correction and additional editing features. Provides one way or bi-directional transmission of perforated tape data at speeds to 60 characters per second. Circle No. 121

Regeneration and Comparator Systems

Accurate, fast verification of tapes and the duplication of tapes and edge-punched cards can be assured on a complete line of tape comparator systems and additions to regeneration systems of Friden, Inc. Systems equipment provides greater efficiency in duplicating and comparing five to eight-bit codes primarily for use in computer and numerical systems applications. A choice of eight systems including comparator and regeneration systems and a combination of both is available. Simultaneous verification and duplication, and information already punched in short individual tapes can be duplicated and compared automatically and combined into one continuous tape at 20 codes per second. A long composite tape facilitates the input of data for wire transmission, computers, tape-to-card converters, address plate embossing machines, recording instruments and other tape-oriented data processing equipment. Circle No. 134

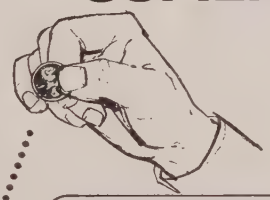
ELIMINATES  ALL REPEAT WRITING FROM PURCHASING-RECEIVING SYSTEMS



BRUNING PENNY-PINCHING COPIERS

Write it *once* and be *right!* That's what you can count on with a Bruning copier at the center of your purchasing-receiving-paying cycle.

With a Bruning copier you write purchase order information *once only*. Then, only receiving data is entered for each delivery. *You eliminate 80% of receiving report paperwork;* eliminate transcription errors; eliminate posting to separate follow-up records; eliminate report delays.



CLEARLY, YOUR CHOICE IS BRUNING

A Bruning copier turns out sharp, clean, black-on-white (or colored) copies on letter-weight paper of anything written, typed or printed on translucent paper... for *only a penny a copy* (for letter-size materials).

To put pleasure...and *profit*...into your purchasing-receiving paperwork, clip and mail the coupon.

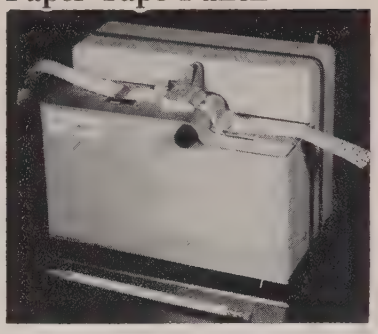
CHARLES BRUNING COMPANY, INC. BA-9
1800 Central Road, Mt. Prospect, Illinois
In Canada: 103 Church St., Toronto 1

☐ Please send further information on Bruning copiers
☐ Please have a sales representative contact me

Name..... Title.....
Company.....
Address.....
City..... County..... State.....

For More Information Circle Reader Service Card No. 167

Paper Tape Punch



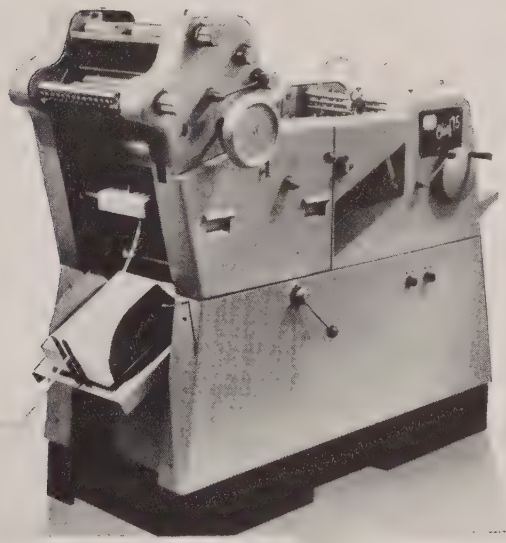
Invac's P-100 motorless, direct-drive paper tape punch will perforate any five, six, seven or eight-channel tape at rates up to 20 characters per second. Compact and lightweight, the unit eliminates all of the usual motors, clutches and interposers; punches are actuated by solenoids and a restoring bail assures positive return. Available in a cabinet for bench or desk use, without a back cover for OEM mounting or with a 19-in. front panel for mounting in a standard relay rack. Circle No. 117

Amount Encoder

An MICR adding amount encoder by National Data Processing Corp. performs a complete inproofing function where storing and endorsing are accomplished by high-speed document handling systems. Items amounts and totals are printed one up on a duplicate paper list simultaneously with encoding to permit direct comparison with deposit slips or transmittals list. Provides automatic zero proof balancing of deposits or transmittal batches, with accumulation of totals for subsequent balancing operations. Amounts and three digits of transaction code are encoded automatically as a by-product of the proving function. In addition to the proof register, the machine has two batch registers and two stacking bins to provide two-way separation of items. Circle No. 125

NOW QUALITY DUPLICATING

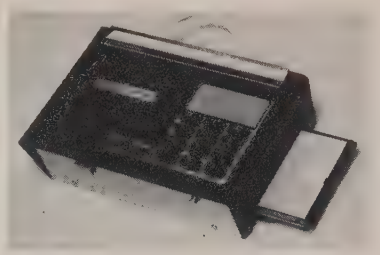
The Chief 15 Offset Duplicator . . . unquestionably the most versatile, most efficient and professional performing offset duplicator for business, industry, institutions and government office use. It comes to you with a most outstanding reputation! No other offset duplicator can equal it. Long respected in the professional printing fields for its excellence in reproduction, its amazing versatility and its flawless performance, the Chief 15 wins every challenge made by today's office duplicating needs. Never has there been a more proven performer . . . never has there been a better investment in an office duplicator. Take a closer look — write today for our informative booklet. Address: American Type Founders, Dept. C, 200 Elmora Ave., Elizabeth, N. J.



AMERICAN TYPE FOUNDERS Business Equipment Division

SOLD IN CANADA BY GESTETNER

Electric Card Punch



Convenient tab settings make it easy to set the book-size, portable, electric Vari-Punch for specific programming. The unit, manufactured by Varifab, Inc., will punch and print any of all 80 columns of a card with standard rectangular holes. Operated off 115-volt A.C. current or a 12-volt batter, the Vari-Punch weighs 5-lb. and measures 8 x 5 x 3-in. Circle No. 123

Storage Cabinets

Reel and/or forms storage cabinets shown above are examples of computer accessory equipment manufactured by Systems Sales Co. "High-Style" line of cabinets comes in a variety of depths and offers chromed steel tubular legs, wide overlay Formica tops and matching decorator colors. Circle No. 111

Xerographic Plate

A faster xerographic plate for the reproduction of halftones, photographs, large solid areas and line work is available from Xerox Corp. Providing an inexpensive substitute for film negatives in the preparation of offset paper and metal masters, the plates offer increased exposure latitudes, reduce the prospect of human error and improve the ease of processing and the quality of output. Plate's greater speed cuts exposure time as much as 75 percent. Works with any type of direct image offset paper master prepared from any original and copies all colors, even reds and blues. Circle No. 120

Proven Performer

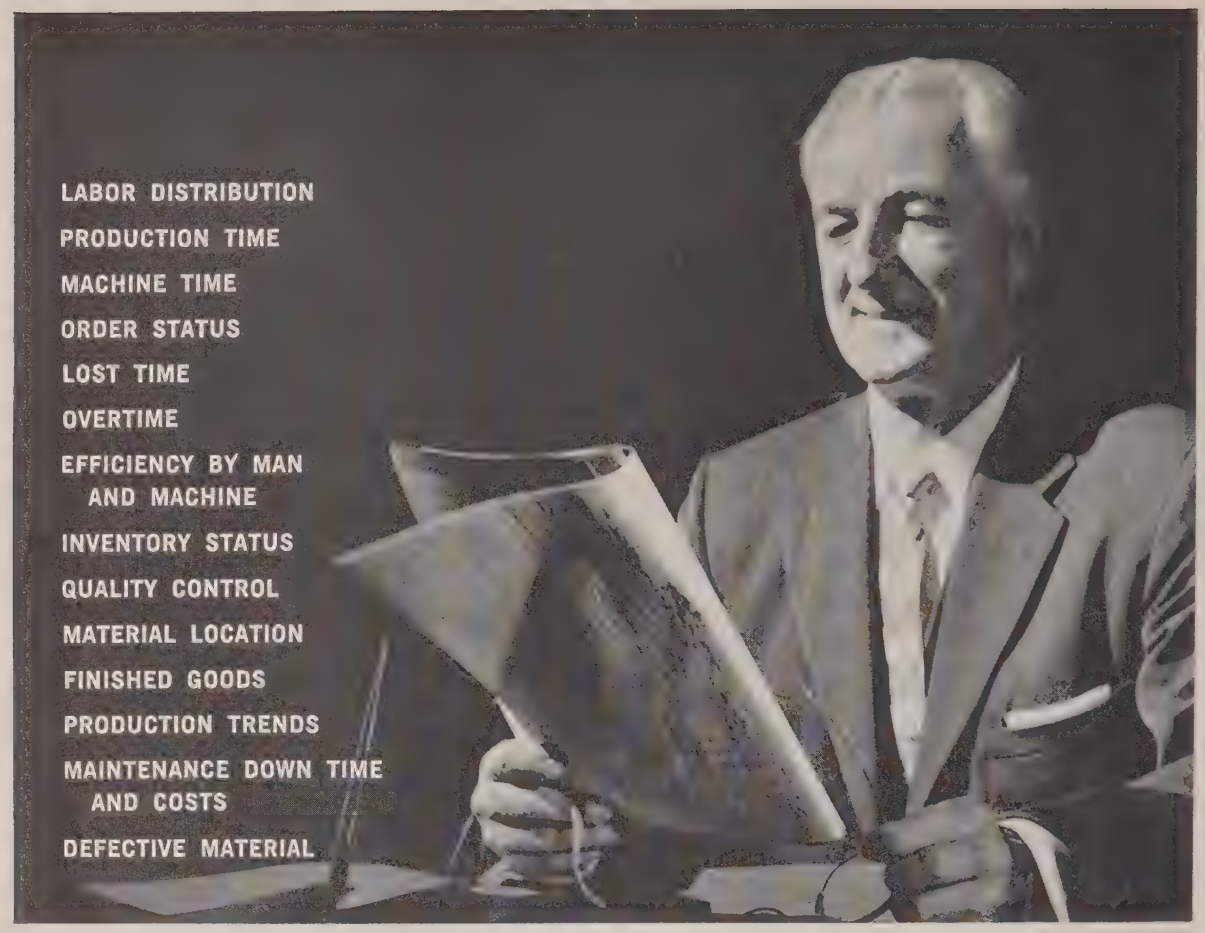
THE BENDIX G-15 COMPUTER...is daily demonstrating its ability to save time and money at hundreds of installations in industry after industry...has established an overall reliability record of 97.4%. Other reasons behind continuing G-15 leadership: ease of use...over 1000 programs immediately available at no charge...versatility and expandability resulting from the widest selection of input-output accessory units. Continuing systems support in depth and a vigorous users EXCHANGE organization combine to broaden application usefulness...assure maximum system effectiveness at minimum cost. Speaking of cost, G-15 proven performance is yours for as little as $1,485 a month. Investigate the Bendix G-15...prove to your own satisfaction how its demonstrated superiority can bring important time and dollar savings to your organization.

Call your Bendix Computer representative, or write:

Bendix Computer Division

DEPT. U-35, LOS ANGELES 45, CALIFORNIA

For More Information Circle Reader Service Card No. 170



How many of these facts are you NOT getting?

Use a Stanrecorder to record *all* the source data that originate in your production departments and you've taken the first step toward *completely automatic* control over labor distribution and production operations.

Listed above are the types of facts that Standard Register's Stanrecorder can collect and record for you—quickly, accurately, and at low cost.

The Stanrecorder gathers all source data on one form—time, man, operation, location, variables, production counts, and order identity. Furthermore, the data are gathered so systematically that subsequent processing can be completely automated, all the way through your accounting system. And still another feature, you obtain a complete audit trail because data are originally entered in exact chronological order on a continuous Standard Register form.

Take the first step toward better business controls. Have the Standard Register representative explain the remarkable new way to record total source data on one form, using the Stanrecorder.

STANDARD REGISTER STANOMATIC SYSTEMS

Business Forms and Forms Handling Equipment for Paperwork Simplification

THE STANDARD REGISTER COMPANY, DAYTON 1, OHIO

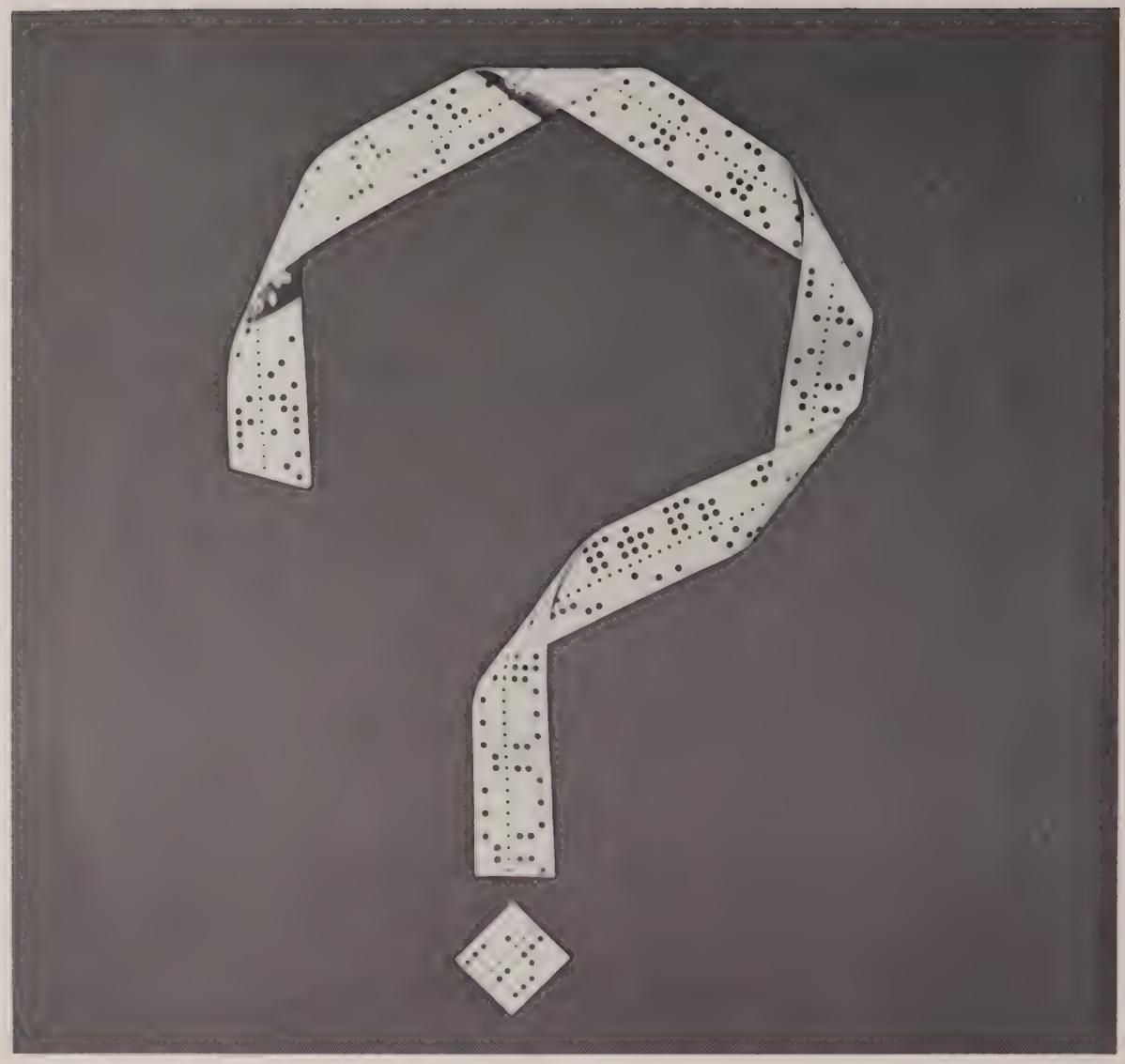
For More Information Circle Reader Service Card No. 171

Microfilm Reader-Printer

The third reader-printer to be marketed by Minnesota Mining and Manufacturing Co., the Filmac 300 projects an image which may be enlarged or reduced without loss of focus. It accepts either 16mm or 35mm microfilm in roll, aperture card, jacket or film sheet form. Two projection lenses provide magnification of eight to 20 diameters and copies can be made in any size up to 11 x 14-in. Applications are suggested where copies of business records, legal documents, newspapers and other published data are needed. Price of the unit is $3,600. Circle No. 130

Copying Machine

"Duet" by Charles F. Bruning Co., Inc., teams the firm's Copyflex diazo process and its low material cost with a photocopy unit that easily copies anything, including colored images or two-sided documents. The bottom section of the machine contains a dual-purpose exposure unit, convertible to diazo or photocopy at the flick of a switch, and a complete diazo process unit with a speed of 12-ft. per minute; upper section contains a complete photocopy processing unit, also geared to 12-ft. per minute. All three units are controlled by a single knob. "Duet" measures 19¾ x 14⅛ x 14¾-in. and weighs 61-lb. Circle No. 114



Why guess at management figures?

Are you relying on management figures that are *almost* complete? Did you know you can now have CURRENT FACTS at your finger tips to assist you in making decisions?

HOW? Through NCR Electronic Data Processing Systems that provide complete management facts and eliminate costly guesswork. NCR Systems go all the way from the original entry to your desk—from cash register, accounting machine, or adding machine ... through the computer, and the high-speed report printer ... to your final reports.

ADVANTAGE? You can now have all the facts to evaluate every trend ... to control every cost factor ... to forecast every critical condition ... and to eliminate guesswork from every business decision. In short, you get greater executive command ... you get *today's* management facts *today,* in time to be used most effectively.

• Punched paper tape is created by NCR Accounting Machines, Cash •
• Registers and Adding Machines as an automatic by-product of nor- •
• mal operation. It is then fed into a computer to produce, at mini- •
• mum cost, the information you need for most profitable control. •

NCR ®TRADEMARK—REG. U.S. PAT. OFF. *National*

ELECTRONIC DATA PROCESSING
ADDING MACHINES • CASH REGISTERS
ACCOUNTING MACHINES
NCR PAPER (NO CARBON REQUIRED)

THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio

1039 OFFICES IN 121 COUNTRIES • 77 YEARS OF HELPING BUSINESS SAVE MONEY

For More Information Circle Reader Service Card No. 190

Wiring Tool

The PWI wiring tool is used for removing fixed or permanent wires from self-contacting control panels in data processing equipment. Just 5½-in. long, lightweight and plastic-encased, it has a pocket clip for easy carrying and sells for $2.75. Circle No. 113

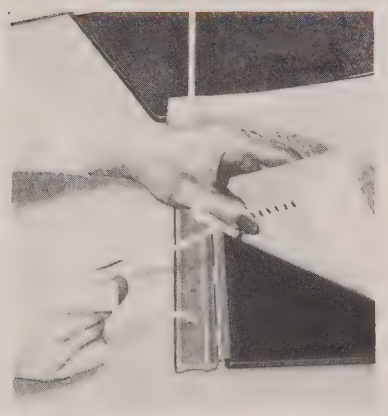
Side-Opening File

Shelvadrawer, a side-opening, ball-bearing suspension drawer file to replace both ordinary drawer-type filing cabinets and shelf files, is manufactured by Wheeldex & Simpla Products, Inc. Available in three, five or seven-level heights, the files are all-welded and suitable to correspondence or legal-size papers. Circle No. 116

Smudge-Proof Labels

A different paper stock with superior smudge resistance is now being used by Avery Label Co. on their Tabulabels, overcoming a specific problem in machine accounting and similar applications, where ink smears make printed information illegible. Four new sizes have been added to the line. Circle No. 131

NOW YOU CAN BIND TAB SHEETS FOR AS LITTLE AS 6¢ PER HUNDRED



You can bind 1500 sheets in a single binder for ready reference in any department...or 2500 for storage...at a lower cost per 100 sheets with Wilson Jones GrayLine Nylon Post binders than any other method. Whether you bind burst sheets, unburst sheets, or both, there are Wilson Jones Binders in every price range to do the job—from as little as $1.10 per binder. NO hidden entries at any opening. Ask your stationer or tabulating supply dealer about them today, or send coupon below.

WILSON JONES

INVENTOR OF THE NYLON POST BINDER

MBA-101

Wilson Jones Company
209 S. Jefferson St., Chicago 6, Illinois

Please send me full information on styles, sizes and features of Grayline Nylon Post Binders

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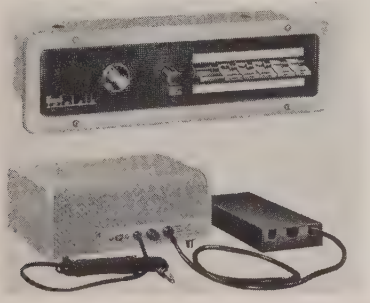
RECORD KEEPING WJ ESSENTIALS

For More Information Circle Reader Service Card No. 175

Dewiring Tool

D-Y-R dewiring tools are used in removing fixed self-contact wires from all makes of control panels, 20 at a time. Manufactured by Randazzo Products, the tool is precision machined from highly-polished airplane bar aluminum. Lightweight, it has no moving parts and sells for $4.95. Tool is placed on the wires and, with a push or tap of the hand, the wires are released and pushed part-way through the panel. Tool is then reversed and used to remove the wires the rest of the way. Circle No. 124

Intercom System

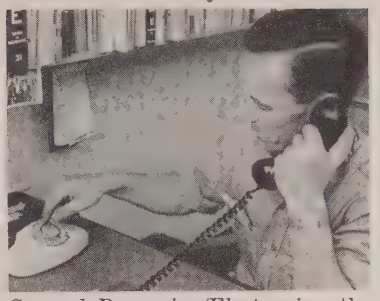


Webster Electric's 2500 Series Teletalk intercom system eliminates amplifiers in each sending and receiving station and uses a single centralized amplifier. Master stations can be located anywhere within 1,000-ft. of the centralized amplifier. Capable of handling 11 different stations, the system features a signal light to tell when it is in use. Any station can originate a call. The 2510 desk top unit measures 12 x 3 x 5½-in. and weighs 4½-lb. Wall-mounted W2510 units (shown above) have a brown steel front panel. Circle No. 128

Non-Skin Black Ink

A new ink which can be used for paper master jobs or with presensitized aluminum, acetate and paper plates has been announced by Davidson Corp. The ink sets quickly on sulphite, bonds and enamel offset stock. Circle No. 132

Push-Button System



General Dynamics/Electronics, the new name of the Stromberg Carlson electronic products division, has announced a more flexible version of the Pagemaster selective wireless paging system—one that can be operated from several different locations. The change is in the encoder unit or means of placing a "page." It consists of a telephone-like dial. Paging is like dialing a telephone and the small instruments can be placed at widely separated points as much as 12 miles from the actual encoder equipment. Up to three instruments can be used. Circle No. 133

Copies On Request

Office Conveyor—Four-page folder from Mercury Industries describes traveling-belt office conveyor, specifications and applications. Circle No. 108

Closed Circuit TV—Fairbanks, Morse & Co. folder describes how closed circuit TV can be used for surveillance, transportation and dispatching, cost reduction and quality control, merchandising, security, observation of hazardous locations, education and in hospitals. Also described is the Mini-Camera. Circle No. 100

Recorder-Reproducer—Four-page, 2-color brochure from Ampex Corp. describes FR-100C instrumentation recorder-reproducer, used in industry, medicine and other scientific fields; military, defense and other applications where accurate data storage and recovery are needed. Circle No. 101

Philco 2000—Two four-color folders by Philco Corp. are entitled "Matrix Operations of the Philco 2000" and "Sort Operations." They cover the features that make for speed of operation. Circle No. 102

Closed Circuit TV—General applications of closed circuit TV are described in a two-color catalog (G-205), offered by Kin Tel Div., Cohu Electronics. Circle No. 103

Computer Application — Application Report 17, issued by Bendix Computer Div., tells how Simoniz Co. uses a Bendix G-15 computer to conduct a complete order control and billing operation, while also providing an invaluable research tool. Circle No. 104

Colored Toners, Developers—Colored toners and developers for special xerographic applications in the preparation of a wide selection of transfer media or for imaging on colored paper stock are described in a folder from Xerox Corp. Circle No. 105

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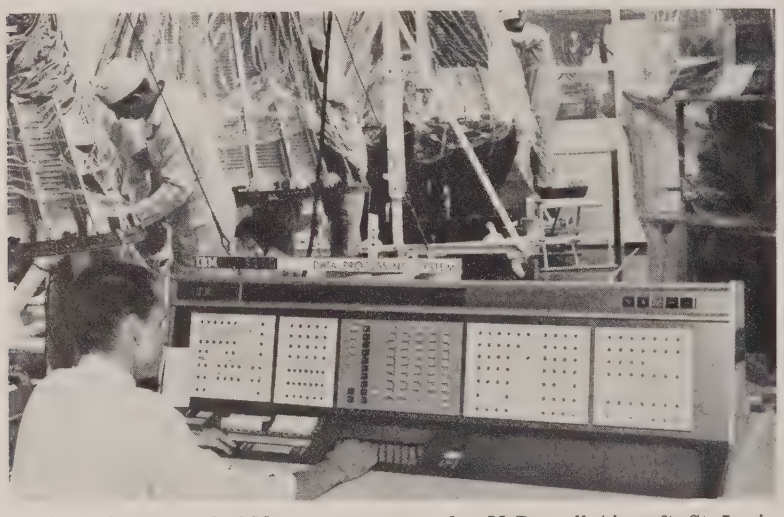
NEWS

McDonnell Service Center Installs IBM 7080



Against a background of Mercury space capsules, McDonnell Aircraft, St. Louis, previews its new IBM 7080 computer installation. The computer is reputed to be the world's fastest commercial data processing system.

The McDonnell Automation Center, a division of the McDonnell Aircraft Corp., St. Louis, is the first firm in the nation to go "on the air" with the new IBM 7080 computer, reported to be the world's fastest commercial data processing system. Addition of the huge solid-state system, which rents for some $60,000 monthly, brings to over $10 million the value of analog and digital equipment in use by the Automation Center and its 400-man staff.

The 7080 was specifically designed for high speed business data processing, but is also a capable scientific computer. It has speeds up to 10 times faster than the IBM 705. Magnetic tape can be read at the rate of 62,500 characters per second. It can add or subtract 90,900 five-digit numbers in a second and in the same time span it can perform 3,770 multiplications of 10-digit numbers and make 333,000 logical decisions.

With its magnetic core storage, the 7080 can store some 160,000 digits of alphabetic or numeric information for use as instructions or tables in processing data. Access time is two millionths of a second.

The McDonnell Automation Center was organized in March 1960 and supplies consulting, systems design, programming, data processing and computing services to more than 30 industries in the East, Midwest and Southwest. The center also handles data processing and computing tasks for the parent corporation, manufacturer of the Mercury space capsule and a leader in aerospace projects.

Systems and Procedures Assn. to Meet October 8-11

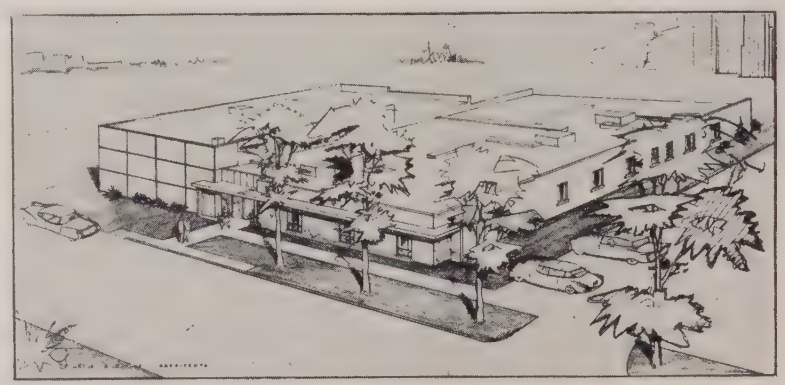
Over 1,000 systems experts are expected to attend the 14th annual International Systems Meeting, sponsored by the Systems and Procedures Assn., October 8-11, at the Hotels Statler-Hilton and Pick-Carter, Cleveland.

Following the theme "The Systems Field—a Management Transition," the four-day meeting will consist of nine Panorama sessions, eight Conference sessions and 26 Seminars.

Arthur K. Watson, president of IBM World Trade Corp., will open the meeting, speaking on the subject "Major World Issues."

According to George E. Garnsey, chairman, other distinguished speakers will include W. F. McCandless, assistant director, U. S. Bureau of the Budget; Aaron Rosenthal, director of financial management, NASA; J. P. Smith, Scott Paper Co.; Ralph Besse, president, Cleveland Electric Illuminating Co.; Dr. Adrian McDonough, Taylor Management Laboratory, Wharton School of Business; Dr. Gibbs Myers, Kearfott Div., General Precision Co.; Albert M. Joseph, Industrial Writing Institute; and Don Crone, Canadian Broadcasting Corp.

Business Automation Moves to a New Home



BUSINESS AUTOMATION has moved to 288 Park Ave. West, Elmhurst, Ill. The new building will be headquarters for all activities of the parent organization, OA Business Publications, Inc., although BUSINESS AUTOMATION NEWS REPORT, a sister publication, will maintain its editorial offices in New York City.

Rem Rand, Westinghouse Develop Control Systems

Remington Rand Div., Sperry Rand Corp., and Westinghouse Electric Corp. have announced plans to work together for the development of automatic control systems for industrial, marine and other applications using electronic computers. Westinghouse will have responsibility for supplying complete systems, including installation and related services.

Almost simultaneously with this announcement, Remington Rand announced the availability of an automatic part programming package for numerically-controlled machine tools involving the Univac Solid-State 80 and 90 computers. The system has been pre-tested by the Rohr Aircraft Corp., Chula Vista, Calif.

From an engineering drawing, a "parts programmers manuscript" is prepared, using appropriate descriptive information. This data is punched into input cards for the computer which, in turn, automatically prepares control card input for the machine tools.

Electronic System Halts Message Handling Delays

Resembling a large-scale digital computer, the high-speed electronic message distribution system developed for the U. S. Army Signal Corps by Minneapolis-Honeywell rapidly and automatically receives, sorts and processes incoming teletype messages.

The system receives messages from several incoming teletypes, electronically remembers them and then routes them according to time of arrival and priority. Top priority messages automatically interrupt those of lesser importance.

Properly termed a Semi-Automatic Teletypewriter Message Distribution System, the installation consists of 40 cabinets of electronic circuitry and storage elements, a control console, five record page printers and 105 terminal teletypewriters. A magnetic drum and magnetic tape units comprise the memory.

The new system eliminates priority and routing tie-ups which previously could delay a message for several hours or more.

NABAC To Assume Control Of MICR Signal Standards

The NABAC Research Institute will assume responsibility for maintaining the signal level standards of Magnetic Ink Character Recognition documents within 90 days. This was announced by Winslow E. Pike, president of NABAC (Association for Bank Audit, Control and Operation), at the 37th annual convention held in Chicago recently.

Pike, vice president and controller of the First National Bank of Atlanta, said that the Research Institute will provide standard test documents to banks, bank equipment manufacturers and imprinters of MICR documents for a charge involving only the basic costs.

Currently, the standard is being maintained as a service to the industry by General Electric Co. at their plant near Phoenix. Maintenance of a signal level standard for MICR imprinting is basic to the electronic reading of the imprinting by machine. A proper metal-ink mixture is necessary to assure accurate reading by the high-speed equipment involved. The Business Equipment Manufacturers Assn. has approved the transfer of responsibility to NABAC. The project will be under the direction of Richard A. Byerly, research director.

Assn. For Computing Machinery Draws 2,000

Nearly 2,000 computer professionals met in Los Angeles September 5-8 for the 16th national conference of the Assn. for Computing Machinery. It was the first ACM conference to present equipment exhibits.

At a special news conference, those interested in "Education in the Computer Era" heard Fred Gruenberger of Rand Corp. predict that 1,000 high schools will have computers within the next few years, creating a need for 10,000 computer course teachers at the high school level.

Such courses are necessary, he said, "to train the one or two million casual computer users which we will need within five years."

To Use Farrington Scanner

Minneapolis-Honeywell will offer optical scanning reading equipment produced by Farrington Mfg. Co. as part of its electronic data processing systems, according to Walter W. Finke. The arrangement is non-exclusive, he added.

Under the terms of the agreement, Honeywell will provide the optical scanning equipment as an automatic on-line input for its H-800 (large-scale) and H-400 (medium-scale) computer systems at the customer's option.

NMAA Moves Headquarters

International headquarters of the National Machine Accountants Assn. has been moved to 524 Busse Hwy., Park Ridge, Ill., according to Calvin Elliott, executive director.

Previous headquarters were situated in Mt. Prospect, Ill.

Royal Users Group To Meet

The annual meeting of the Midwestern Region of POOL, Royal Precision electronic computer equipment users' group, will be held at the Lake Tower Motel in Chicago, October 5-6.

Members from 12 states will attend the meeting to discuss such subjects as computer scheduling, PERT, common denominator symbolic programing and allied topics.

Royal Precision equipment is manufactured by Royal McBee Corp.

Software To Be Discussed

Fall conference of the Univac Users Assn. will be held at the Warwick Hotel, Philadelphia, October 11-13. The theme will be "Hard Facts About Software."

For further information, contact Walter Edmiston, secretary, Philadelphia Naval Shipyard, Philadelphia 12.

Theme To Be 'Total Systems'

The theme of the December 12-14 Eastern Joint Computer Conference in Washington will be "Computers —Key to Total Systems Control."

According to Dr. Jack Moshman, chairman, 31 papers will be presented at the conference and topics will include "Total Systems in Real Time," "Systems Simulation," "Advances in Equipment," "Communications Systems" and "Programing and Applications."

Sponsor will be the newly-formed American Federation of Information Processing Societies (AFIPS).

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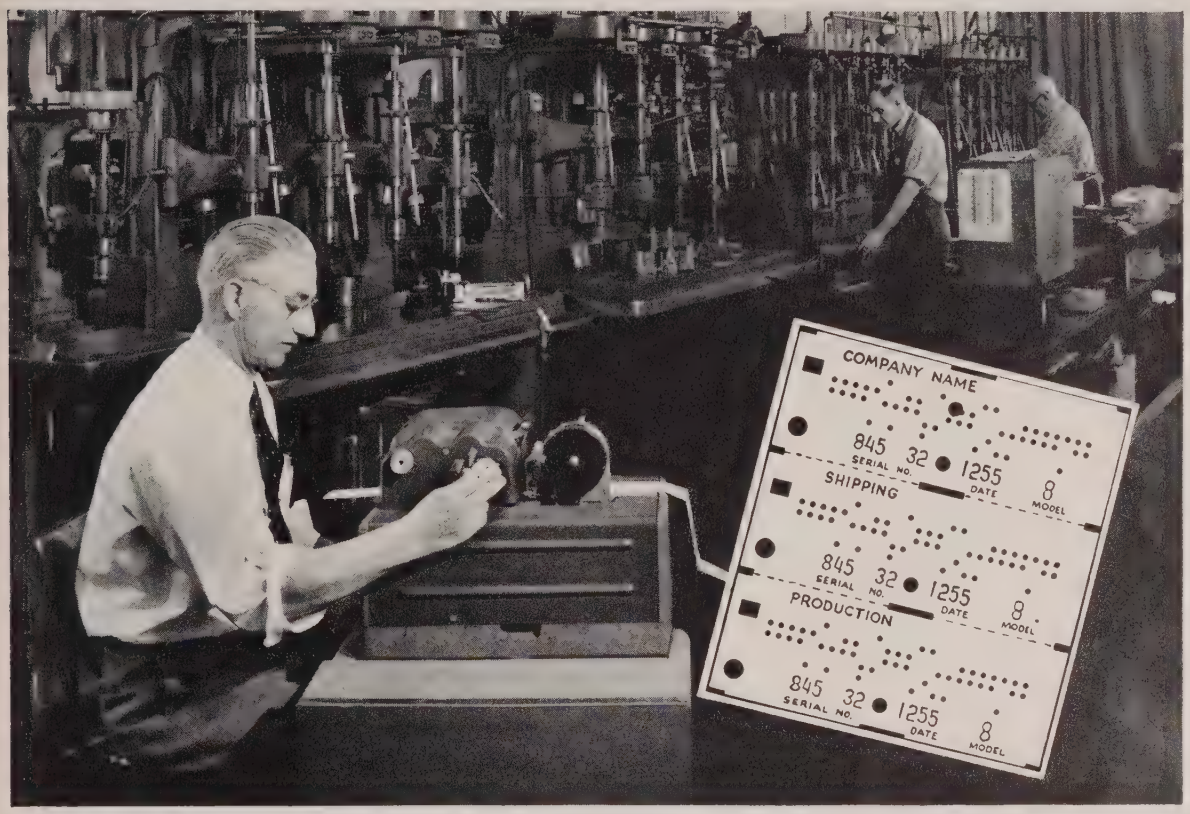

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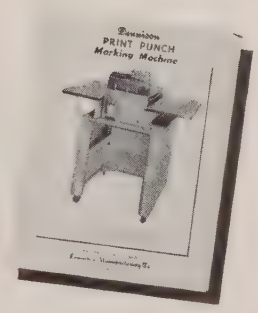

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Business Calendar

October 4-5—Buffalo, N. Y., Chapter of the National Assn. of Accountants sponsors the 26th Biennial Regional Business Show in the Memorial Auditorium.

October 8-11—International Systems Meeting of the Systems and Procedures Assn. will be held in Cleveland, Ohio, at the Statler-Hilton and Pick-Carter Hotels. For more information: Lawrence E. Melick, Secretary, 1961 ISM, c/o Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

October 12-13—Third Annual Conference, Indianapolis and Ft. Wayne Chapters of National Machine Accounting Assn., at the Marott Hotel, Indianapolis, Ind.

October 16-17 — Assn. of Data Processing Service Organizations holds a West Coast Management Symposium at the Ambassador Hotel, Los Angeles. Contact: W. H. Evans, 1000 Highland Ave., Abington, Pa.

October 24-27—The National Business Exposition "Execurama" at the Shrine Exposition Hall, Los Angeles. Contact: George Stromme, The Stromme Co., 1350 North Highland, Los Angeles 28.

October 25-26 — 1961 Computer Applications Symposium, sponsored by the Armour Research Foundation, Illinois Institute of Technology, will be held at the Morrison Hotel, Chicago. Contact: Benjamin Mittman, chairman, Armour Research Foundation, 10 W. 35th St., Chicago 16.

October 25-27 — Fifth Electronic Business Systems Conference will be sponsored by the Western Div., National Machine Accountants Assn., at Lafayette Hotel, Long Beach, Calif. Contact: P.O. Box 7365, Long Beach, Calif.

October 30-November 3 — Eighth Institute on Electronics in Management will be held at The American University, 1901 F St., N.W., Washington, D. C. The institute is sponsored by the university's School of Government and Public Administration. Contact: Dr. Lowell H. Hattery, director.

ADVERTISERS' INDEX – OCTOBER, 1961

EDITORIAL

The Bomb— and Business

The Kremlin's new atomic blasts bring us face to face with the appalling fact that nuclear warfare is now a very real possibility. To assume otherwise is to play Russian roulette with a fully loaded gun.

While we can, and should, continue to pray and work for peace, it would seem most prudent to prepare for survival. Our paramount project, of course, is the survival of our people, but it also is important that we prepare for the safeguarding of important data that will be vital to the resumption of government and business enterprises following an atomic attack.

There are many who sincerely question the desirability of any human surviving a nuclear holocaust, not alone the value of salvaging facts and figures. True, if Khrushchev's bombs reach these shores, the destruction may well be beyond present comprehension. Nevertheless, based on expert Civil Defense testimony, it seems reasonable to assume that much of America would escape or survive the attacks.

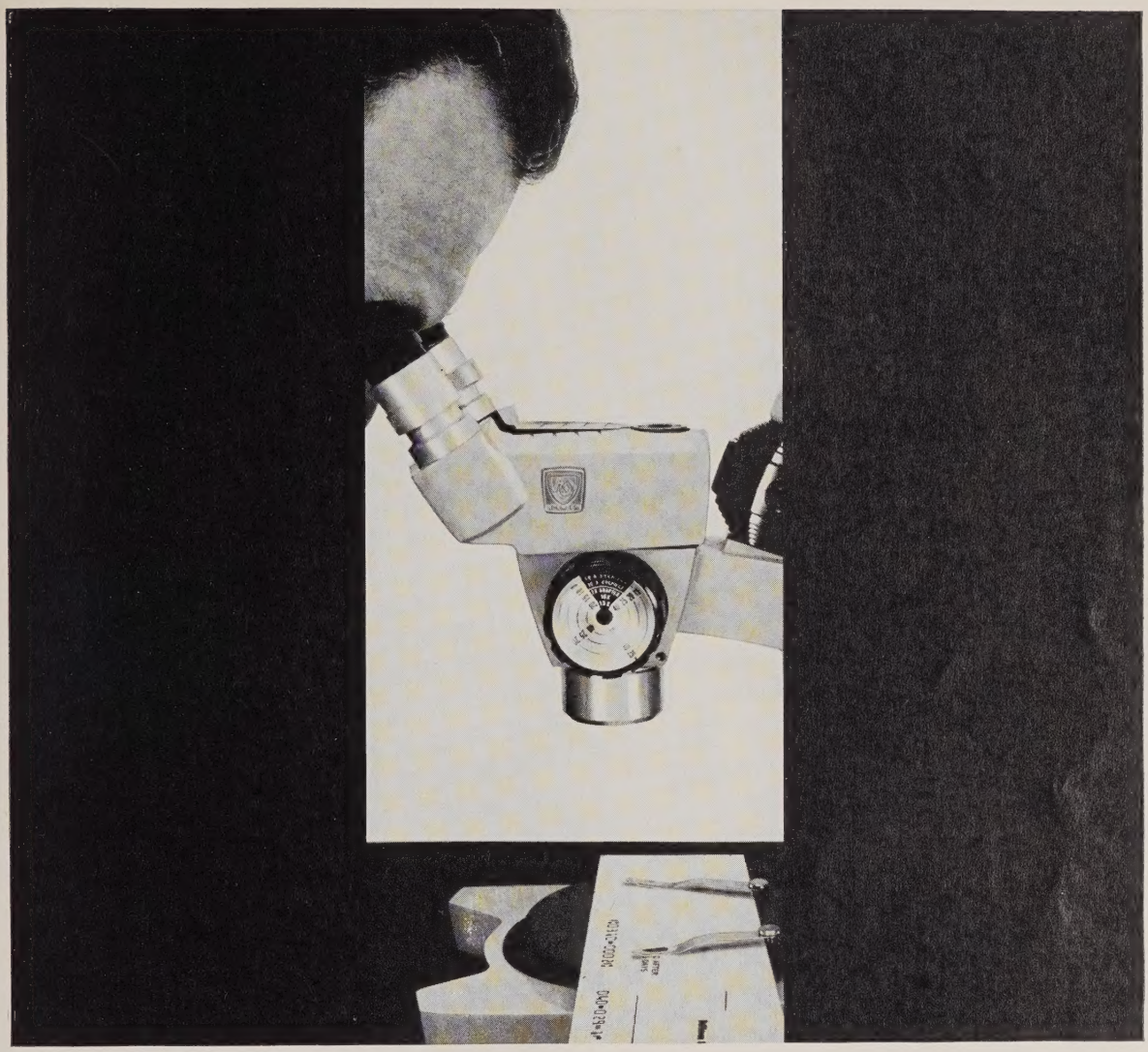
Unfortunately, the majority of our government, financial and business operations have centralized their data processing and record storage facilities in areas that can expect the full impact of any Russian attack. While it may be impossible to move the operations to safer areas, certainly some thought should be given to the storage of duplicate records in a location more likely to escape the effects of a nuclear blast.

Depending on the method of transmission and storage, costs would vary. But the cost seems incidental in comparison to the possibility of the complete destruction of a company's entire operating record or the loss of invaluable government files.

Some firms already have taken steps to protect their records. The First National Bank of Boston recently completed a huge underground storage center at Pepperell, Mass., which it also leases to other member and associate banks of the Boston Clearing House Assn. The Industrial Bank of Providence is building an underground computer center that will house the customer records for each of its 45 offices.

But in general, few enterprises have taken action to prepare their records for an atomic eventuality. By failing to do so, many firms are inviting their own Pearl Harbor.

Arnold E. Keller



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